United Nations

FCCC/ARR/2017/NLD

Framework Convention on Climate Change

Distr.: General
30 May 2018

English only

Report on the individual review of the annual submission of the Netherlands submitted in 2017*

Note by the expert review team

Summary

Each Party included in Annex I to the Convention must submit an annual greenhouse gas (GHG) inventory covering emissions and removals of GHG emissions for all years from the base year (or period) to two years before the inventory due date (decision 24/CP.19). Parties included in Annex I to the Convention that are Parties to the Kyoto Protocol are also required to report supplementary information under Article 7, paragraph 1, of the Kyoto Protocol with the inventory submission due under the Convention. This report presents the results of the individual inventory review of the 2017 annual submission of the Netherlands, conducted by an expert review team in accordance with the "Guidelines for review under Article 8 of the Kyoto Protocol". The review took place from 11 to 16 September 2017 in Utrecht, the Netherlands.

* In the symbol for this document, 2017 refers to the year in which the inventory was submitted, not to the year of publication.

GE.18-08642(E)

1808642

Please recycle

Contents

		Paragraphs	*Page*
	Abbreviations and acronyms		3
I.	Introduction	1–5	5
II.	Summary and general assessment of the 2017 annual submission	6	6
III.	Status of implementation of issues and/or problems raised in the previous review report	7	8
IV.	Issues identified in three successive reviews and not addressed by the Party	8	24
V.	Additional findings made during the 2017 individual inventory review	9	25
VI.	Application of adjustments	10	45
VII.	Accounting quantities for activities under Article 3, paragraph 3, and, if any, activities under Article 3, paragraph 4, of the Kyoto Protocol	11	45
VIII.	Questions of implementation	12	45
Annexes			
I.	Overview of greenhouse gas emissions and removals for the Netherlands for submission year 2017 and data and information on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, as submitted by the Netherlands		46
II.	Information to be included in the compilation and accounting database		50
III.	Additional information to support findings in table 2		52
IV.	Documents and information used during the review		53

Abbreviations and acronyms

2006 IPCC Guidelines	*2006 IPCC Guidelines for National Greenhouse Gas Inventories*
AAU	assigned amount unit
AD	activity data
AER	annual environmental report
Annex A sources	source categories included in Annex A to the Kyoto Protocol
AR	afforestation and reforestation
Article 8 review guidelines	"Guidelines for review under Article 8 of the Kyoto Protocol"
Bo	maximum methane production potential
CER	certified emission reduction
CH_4	methane
CHP	combined heat and power
CM	cropland management
CO_2	carbon dioxide
CO_2 eq	carbon dioxide equivalent
CPR	commitment period reserve
CRF	common reporting format
CSC	carbon stock change
DOC	degradable organic carbon
DOC_f	fraction of degradable organic carbon decomposed
DOM	dead organic matter
EAF	electric arc furnace
EF	emission factor
ERT	expert review team
ERU	emission reduction unit
EU ETS	European Union Emissions Trading System
FGD	flue gas desulphurization
FM	forest management
FMRL	forest management reference level
FOD	first order decay
$Frac_{GRAZ}$	fraction of livestock nitrogen excreted and deposited onto soil during grazing
GHG	greenhouse gas
GM	grazing land management
HFC	hydrofluorocarbon
HWP	harvested wood products
IE	included elsewhere
IEF	implied emission factor
IPCC	Intergovernmental Panel on Climate Change
IPPU	industrial processes and product use
k	decay rate constant

KP-LULUCF activities	activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol
Kyoto Protocol Supplement	*2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol*
LULUCF	land use, land-use change and forestry
MCF	methane correction factor
MMS	manure management system
N	nitrogen
NA	not applicable
NE	not estimated
NFI	national forest inventory
NF_3	nitrogen trifluoride
NIR	national inventory report
NO	not occurring
NOx	nitrogen oxides
N_2O	nitrous oxide
PFC	perfluorocarbon
PPSR	previous period surplus reserve
QA/QC	quality assurance/quality control
RMU	removal unit
RV	revegetation
SF_6	sulfur hexafluoride
UNFCCC	United Nations Framework Convention on Climate Change
UNFCCC Annex I inventory reporting guidelines	"Guidelines for the preparation of national communications by Parties included in Annex I to the Convention, Part I: UNFCCC reporting guidelines on annual greenhouse gas inventories"
UNFCCC review guidelines	"Guidelines for the technical review of information reported under the Convention related to greenhouse gas inventories, biennial reports and national communications by Parties included in Annex I to the Convention"
WDR	wetland drainage and rewetting
Wetlands Supplement	*2013 Supplement to the 2006 Intergovernmental Panel on Climate Change Guidelines for National Greenhouse Gas Inventories: Wetlands*

I. Introduction[1]

1. This report covers the review of the 2017 annual submission of the Netherlands organized by the secretariat, in accordance with the Article 8 review guidelines (decision 22/CMP.1, as revised by decision 4/CMP.11). In accordance with the Article 8 review guidelines, this review process also encompasses the review under the Convention as described in the UNFCCC review guidelines, particularly in part III thereof, namely the "UNFCCC guidelines for the technical review of greenhouse gas inventories from Parties included in Annex I to the Convention" (decision 13/CP.20). The review took place from 11 to 16 September 2017 in Utrecht, the Netherlands, and was coordinated by Mr. Tomoyuki Aizawa (secretariat). Table 1 provides information on the composition of the ERT that conducted the review of the Netherlands.

Table 1

Composition of the expert review team that conducted the review of the Netherlands

Area of expertise	*Name*	*Party*
Generalist	Mr. Newton Paciornik	Brazil
Energy	Mr. Hiroshi Ito	Japan
IPPU	Ms. Ingrid Person Rocha e Pinho	Brazil
Agriculture	Mr. Sorin Deaconu	Romania
LULUCF	Ms. Nele Rogiers	Switzerland
Waste	Mr. Sabin Guendehou	Benin
Lead reviewers	Mr. Deaconu	
	Mr. Paciornik	

2. The basis of the findings in this report is the assessment by the ERT of the consistency of the Party's 2017 annual submission with the Article 8 review guidelines. The ERT has made recommendations that the Netherlands resolve the findings related to issues,[2] including issues designated as problems.[3] Other findings, and, if applicable, the encouragements of the ERT to the Netherlands to resolve them, are also included.

3. A draft version of this report was communicated to the Government of the Netherlands, which provided comments that were considered and incorporated, as appropriate, into this final version of the report.

4. Annex I shows annual GHG emissions for the Netherlands, including totals excluding and including the LULUCF sector, indirect CO_2 emissions and emissions by gas and by sector. Annex I also contains background data related to emissions and removals from KP-LULUCF activities, if elected, by gas, sector and activity for the Netherlands.

5. Information to be included in the compilation and accounting database can be found in annex II.

[1] At the time of publication of this report, the Netherlands had submitted its instrument of ratification of the Doha Amendment; however, the amendment had not yet entered into force. The implementation of the provisions of the Doha Amendment is therefore considered in this report in the context of decision 1/CMP.8, paragraph 6, pending the entry into force of the amendment.

[2] Issues are defined in decision 13/CP.20, annex, paragraph 81.

[3] Problems are defined in decision 22/CMP.1, annex, paragraphs 68 and 69, as revised by decision 4/CMP.11.

II. Summary and general assessment of the 2017 annual submission

6. Table 2 provides the assessment by the ERT of the annual submission with respect to the tasks undertaken during the review. Further information on the issues identified, as well as additional findings, may be found in tables 3 and 5.

Table 2

Summary of review results and general assessment of the inventory of the Netherlands

Assessment			*Issue or problem ID#(s) in table 3 and/or 5[a]*
Date of submission	Original submission: 14 April 2017 (NIR), 14 April 2017, Version 5 (CRF tables), 14 April 2017 (standard electronic format tables)		
Review format	In-country		
Application of the requirements of the UNFCCC Annex I inventory reporting guidelines and Wetlands Supplement (if applicable)	1. Have any issues been identified in the following areas:		
	(a) Identification of key categories	No	
	(b) Selection and use of methodologies and assumptions	Yes	I.3, I.7, I.10, I.16, A.1, L.4, L.13, L.16, W.10, KL.5
	(c) Development and selection of EFs	No	
	(d) Collection and selection of AD	Yes	I.8, I.18, I.23, L.5
	(e) Reporting of recalculations	No	
	(f) Reporting of a consistent time series	Yes	E.11, E.19, E.25, W.5, W.16, W.17, W.18
	(g) Reporting of uncertainties, including methodologies	Yes	G.1
	(h) QA/QC	QA/QC procedures were assessed in the context of the national system (see para. 2 in this table)	
	(i) Missing categories/completeness[b]	Yes	E.17, E.29, I.3, A.8, L.1, L.9, L.18, KL.14
	(j) Application of corrections to the inventory	No	
Significance threshold	For categories reported as insignificant, has the Party provided sufficient information showing that the likely level of emissions meets the criteria in paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines?	The Party did not report "NE" for any insignificant categories	
Description of trends	Did the ERT conclude that the description in the NIR of the trends for the different gases and sectors is reasonable?	No	E.7, E.8, E.10, E.12, A.4
Supplementary information under the Kyoto Protocol	2. Have any issues been identified related to the national system:		
	(a) The overall organization of the national system, including the effectiveness and reliability of the institutional, procedural and	No	

Assessment			*Issue or problem ID[a](s) in table 3 and/or 5[a]*
	legal arrangements		
	(b) Performance of the national system functions	Yes	G.9
	3. Have any issues been identified related to the national registry:		
	(a) Overall functioning of the national registry	Yes	G.3
	(b) Performance of the functions of the national registry and the technical standards for data exchange	No	
	4. Have any issues been identified related to reporting of information on ERUs, CERs, AAUs and RMUs and on discrepancies reported in accordance with decision 15/CMP.1, annex, chapter I.E, taking into consideration any findings or recommendations contained in the standard independent assessment report?	No	
	5. Have any issues been identified in matters related to Article 3, paragraph 14, of the Kyoto Protocol, specifically problems related to the transparency, completeness or timeliness of the reporting on the Party's activities related to the priority actions listed in decision 15/CMP.1, annex, paragraph 24, including any changes since the previous annual submission?	Yes	G.13
	6. Have any issues been identified related to the reporting of LULUCF activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, as follows:		
	(a) Reporting requirements in decision 2/CMP.8, annex II, paragraphs 1–5	Yes	KL.6
	(b) Demonstration of methodological consistency between the reference level and reporting on forest management in accordance with decision 2/CMP.7, annex, paragraph 14	Yes	KL.5, KL.6, KL.14
	(c) Reporting requirements of decision 6/CMP.9	No	
	(d) Country-specific information to support provisions for natural disturbances, in accordance with decision 2/CMP.7, annex, paragraphs 33 and 34	Yes	KL.8
CPR	Was the CPR reported in accordance with the annex to decision 18/CP.7, the annex to decision 11/CMP.1 and decision 1/CMP.8, paragraph 18?	No	G.4
Adjustments	Has the ERT applied an adjustment under Article 5, paragraph 2, of the Kyoto Protocol?	No	
	Did the Party submit a revised estimate to replace a previously applied adjustment?	NA	The Party does not have a previously applied adjustment
Response from the Party during the review	Has the Party provided the ERT with responses to the questions raised, including the data and information necessary for the assessment of conformity with the UNFCCC Annex I inventory reporting guidelines and any further guidance adopted by the Conference of the	Partially	I.2, I.13

Assessment			*Issue or problem ID[a](s) in table 3 and/or 5[b]*
	Parties?		
Recommendation for an exceptional in-country review	On the basis of the issues identified, does the ERT recommend that the next review be conducted as an in-country review?	No	
Question of implementation	Did the ERT list a question of implementation?	No	

[a] The ERT identified additional issues and/or problems in all sectors that are not listed in this table but are included in table 3 and/or 5.

[b] Missing categories for which methods are provided in the 2006 IPCC Guidelines may affect completeness and are listed in annex III.

III. Status of implementation of issues and/or problems raised in the previous review report

7. Table 3 compiles all the recommendations made in previous review reports that were included in the previous review report, published on 23 June 2017.[4] For each issue and/or problem, the ERT specified whether it believes the issue and/or problem has been resolved by the conclusion of the review of the 2017 annual submission and provided the rationale for its determination, which takes into consideration the publication date of the previous review report and national circumstances.

Table 3
Status of implementation of issues and/or problems raised in the previous review report of the Netherlands

ID[a]	*Issue and/or problem classification[b]*	*Recommendation made in previous review report*	*ERT assessment and rationale*
General			
G.1	Uncertainty analysis (G.4, 2016) (G.4, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Provide the level and trend uncertainty assessment as required by paragraphs 15 and 42 of the UNFCCC Annex I inventory reporting guidelines.	Addressing. The Party reported (in NIR table A2.3) the uncertainty analysis for the latest reported year and the trend. However, it did not report the uncertainty analysis for the base year as required by paragraph 15 of the UNFCCC Annex I inventory reporting guidelines. In addition to the uncertainty analysis with LULUCF for the latest year, the Party provided (in annex 2 to the NIR) an uncertainty analysis without LULUCF, which is not a requirement of the UNFCCC Annex I inventory reporting guidelines.
G.2	Uncertainty analysis (G.5, 2016) (G.5, 2015) Comparability	Report on the uncertainty analysis including the LULUCF sector.	Resolved. The Party included the LULUCF sector in its uncertainty analysis (NIR section 1.6 and annex 2).
G.3	Kyoto Protocol units (G.7, 2016) (G.7, 2015) Adherence to	Include information on the application of decision 1/CMP.8, paragraphs 23–26, related to carry-over and the PPSR account.	Not resolved. The Party did not include in the NIR information related to carry-over and the PPSR account. During the review the Party explained that it will not carry over any Kyoto Protocol units from the first to the second

[4] FCCC/ARR/2016/NLD.

ID#	Issue and/or problem classification[a]	Recommendation made in previous review report	ERT assessment and rationale
	reporting guidelines under Article 7, paragraph 1, of the Kyoto Protocol		commitment period. It also stated that until the Doha Amendment enters into force, it will not open a PPSR account in its national registry. The Netherlands further informed the ERT that it will provide information on carry-over and the PPSR account in the next annual submission.
G.4	Commitment period reserve (G.8, 2016) (G.8, 2015) Adherence to reporting guidelines under Article 7, paragraph 1, of the Kyoto Protocol	Provide the calculated value of the CPR.	Not resolved. The Party did not provide in the NIR the calculated value of the CPR, but informed of its intention to provide the value in the next annual submission.
G.5	QA/QC and verification (G.11, 2016) (G.11, 2015) Transparency	Include information on the QA activities for the national inventory in the NIR, including information on the independent peer review of the inventory and a description of the responsibilities of institutions involved in the national system for specific QA/QC activitie .	Addressing. The Party reported in the NIR (p.241) on the peer reviews conducted. However, it did not include in the sectoral parts of the NIR the results for the categories assessed. During the review the Netherlands provided information on its institutional arrangements, including the QA/QC programme and plan (see ID# G.11 in table 5 below), but that information is not yet included in the NIR. Further, it did not enhance the information included in section 1.2 of the NIR on the responsibilities of the institutions involved (see also ID# G.11 in table 5).
G.6	NIR (G.14, 2016) (G.15, 2015) Transparency	Include all underlying data and methodological information directly within the NIR (particularly for the energy, IPPU and waste sectors) and/or ensure that all required documentation in support of the NIR is provided in the public domain in a timely manner and remove any obsolete documentation from the inventory website.	Not resolved. The Party reported in the NIR (annex 3, p.338) that a detailed description of methodologies per source/sink category, including a list of country-specific EFs, can be found in the relevant methodology reports on the inventory website (http://english.rvo.nl/nie). The ERT commends the Party for the improved organization of the website. However, it concluded that the website cannot be considered as part of the annual submission because the website could be changed after the submission. Moreover, the ERT identified that the methodological information provided in the NIR and/or the methodological reports is not always sufficient to provide the necessary transparency in accordance with paragraph 50 of the UNFCCC Annex I inventory reporting guidelines (see also ID# G.10 in table 5).
G.7	Other (G.13, 2016) (G.14, 2015) Transparency	The next review to be an in-country review organized in the Netherlands.	Resolved. The review of the 2017 annual submission of Netherlands was conducted as an in-country review. During the review the ERT worked closely with the Party and reviewed its inventories, including information that was not part of the official submission but was provided during the review. Specific information on the issues that were part of the recommendation for the in-country review is available in the description of other findings, in table 5.

ID[a]	*Issue and or problem classification[a]*	*Recommendation made in previous review report*	*ERT assessment and rationale*
G.8	National registry (G.6, 2016) (G.6, 2015) Transparency	Update the publicly available information in the national registry in accordance with the recommendations in the standard independent assessment report.	Addressing. The Party provided a reference to the publicly available information in the NIR (section 12.1.4, p.268, row 2, column 2) (http://www.emissionsauthority.nl/topics/public-information-kyoto). The ERT noted that the published information dates from 13 January 2017; however, it could find up-to-date information at https://ets-registry.webgate.ec.europa.eu/euregistry/NL/public/reports/publicReports.xhtml. The ERT notes that updating the referenced public website or referring to the information cited above could contribute to resolve the issue.
Energy			
E.1	1. General (energy sector) – all fuels – CO_2, CH_4 and N_2O (E.1, 2016) (E.1, 2015) (19, 2014) (23, 2013) Adherence to UNFCCC Annex I inventory reporting guidelines	Improve the QC procedures to ensure that all the information provided in the CRF tables and the NIR is consistent (e.g. regarding the methods used to estimate CO_2 emissions from manufacture of solid fuels and other energy industries).	Addressing. The Party included a detailed description of its QA/QC procedures in the NIR (section 1.2.3.2, p.38). However, the ERT noted several discrepancies between the CRF tables and NIR table 3.1. The ERT notes that addressing the discrepancies between NIR table 3.1 and the CRF tables could resolve this issue.
E.2	1. General (energy sector) – all fuels – CO_2, CH_4 and N_2O (E.7, 2016) (E.7, 2015) Transparency	Add the following information to the table in annex 5 to the NIR: (1) a clarification of whether the carbon content factors are reported in terms of gross calorific value or net calorific value; (2) CH_4 and N_2O EFs; and (3) direct references for each of the country-specific and plant-specific EFs provided.	Addressing. The Party reported calorific values and standard CO_2 EFs for each fuel in annex 5 to the NIR (p.341) but none of the other recommended information.
E.3	1. General (energy sector) – all fuels – CO_2, CH_4 and N_2O (E.8, 2016) (E.8, 2015) Transparency	Include explanations in the NIR to describe the categories or sources and sinks that are reported as "NO" or "NE" and any other relevant information for all categories for which methodologies are provided in the 2006 IPCC Guidelines.	Addressing. The Party did not provide in the NIR explanations for category 1.C CO_2 transport and storage being reported as "NO" in CRF table 1.C or for category 1.B.2.a.6 other being reported as "NE" for CO_2 and CH_4 emissions. During the review the Party explained why those categories were reported as "NO" and "NE".
E.4	Comparison with international data – – all fuels – all gases (E.10, 2016) (E.10, 2015) Accuracy	Improve the QA/QC processes to ensure the use of accurate and consistent fuel data throughout the GHG inventory.	Addressing. The Party included a detailed description of its QA/QC procedures in the NIR (section 1.2.3.2, p.38). However, the ERT noted several discrepancies between the statistics from which the AD were derived and the information in the NIR.
E.5	Comparison with international data – – all fuels – all gases (E.11, 2016) (E.11, 2015) Transparency	Specify in the NIR the allocation of all fuels used in the reference approach and ensure that the allocations correspond with the fuel lists in the national energy balance and International Energy Agency data.	Not resolved. The Party did not report the allocation of all fuels used in the reference approach in the NIR, but the ENINA (2017) methodology report (chapter 2.1) contains the information on all the fuels listed in national and IEF energy balance. During the review the Party informed the ERT that the allocation will be

ID[a]	Issue and or problem classification[b]	Recommendation made in previous review report	ERT assessment and rationale
			included in the next NIR.
E.6	Feedstocks, reductants and other non-energy use of fuels – liquid fuels – CO_2 (E.12, 2016) (E.12, 2015) Transparency	Provide the information in CRF table 1.A(d) to clarify which category or categories have been used to report the CO_2 emissions from non-energy use of fuels or, if that is not possible for the Party, update the category-specific planned improvements for this category in the NIR to demonstrate that this improvement is planned for future submissions.	Resolved. The Party reported on the allocation of CO_2 emissions from non-energy use in CRF table 1.A(d).
E.7	1.A.1.a Public electricity and heat production – – liquid fuels – CO_2, CH_4 and N_2O (E.13, 2016) (E.13, 2015) Transparency	Clarify, in the NIR, the allocation of emissions from incinerated waste oils and solvents and justify the applicable AD, EFs and emission trend.	Not resolved. The Party has not reported the information on the allocation of emissions from incinerated waste oils and solvents and has not justified the applicable AD, EFs and emissions trend in the NIR. During the review the Party explained that this recommendation will be implemented in the next NIR.
E.8	1.A.1.a Public electricity and heat production – solid fuels – CO_2 (E.14, 2016) (E.14, 2015) Transparency	Provide in the NIR the reasons behind the fluctuations in the CO_2 IEF throughout the time series.	Not resolved. The Party did not report the reasons in the NIR, but explained during the review that the information will be included in the next NIR.
E.9	1.A.1.a Public electricity and heat production – other fossil fuels – CH_4 (E.15, 2016) (E.15, 2015) Transparency	Document the factor of zero for CH_4 and include the underlying methods and assumptions used in reporting on the CH_4 emissions from other fossil fuels in the NIR.	Resolved. The Party reported the recommended information in the NIR (p.79). Additionally, during the review the Party provided the reference (ENINA, 2017) for the CH_4 EF for incineration of waste in other fossil fuels.
E.10	1.A.1.c Manufacture of solid fuels and other energy industries – gaseous fuels – CO_2 (E.16, 2016) (E.16, 2015) Transparency	Provide in the NIR the reasons behind the fluctuations in the CO_2 IEF throughout the gas combustion time series and explain how the consistency of the time series and EFs are ensured in estimating CO_2 emissions from this category.	Not resolved. The Party did not report the reasons in the NIR, but explained during the review that the information will be included in the next NIR.
E.11	1.A.2.c Chemicals – liquid fuels – CO_2, CH_4 and N_2O (E.17, 2016) (E.17, 2015) Consistency	Use more up-to-date data from the most recently available data sources, such as AERs or EU ETS data, in order to improve the time-series consistency of CO_2, CH_4 and N_2O emission estimates from chemical waste gases (if the data are suitable to use for previous years), or, if that is not possible, include in the NIR a detailed category-specific improvement plan and explain how the time-series consistency for the AD	Not resolved. During the review the Party explained that the estimates of CO_2 emissions were based on company-specific data and country-specific emission data. Further, the Party explained that new AER or EU ETS data may not be suitable for use to calculate the CO_2 emission estimates for the earlier years and that the availability of such data will be checked. The ERT considers that additional documentation would be required to demonstrate time-series consistency if EU ETS data were applied.

ID#	Issue and or problem classification[a]	Recommendation made in previous review report	ERT assessment and rationale
		is ensured for the emission estimates for this category.	
E.12	1.A.4.c Agriculture/forestry /fishing – gaseous fuels – CH_4 (E.18, 2016) (E.18, 2015) Transparency	Explain in the NIR the reasons for the variation in the CH_4 IEF for gaseous fuels, including the quantities of natural gas combusted in gas engines and other appliances for the whole time series.	Not resolved. The Party did not report the reasons in the NIR. During the review it explained that this information will be included in the next NIR.
E.13	1.B.1.b Solid fuel transformation – solid fuels – CH_4 (E.19, 2016) (E.19, 2015) Transparency	Include the explanation of the trend in the AD affecting the CH_4 IEF for solid fuels, including for charcoal production, in the relevant section of the NIR.	Resolved. The Party described the trend in the AD of charcoal production in the NIR (p.115). During the review the Party provided the time series of AD for charcoal production.
E.14	1.B.2.b Natural gas – gaseous fuels – CO_2, CH_4 and N_2O (E.21, 2016) (E.21, 2015) Transparency	Expand the text in the NIR on the revised method by detailing the scope of the revised method (to clearly demonstrate completeness), including justification for the applied EFs, and specifically reference all relevant reports.	Resolved. The Party reported in the NIR (p.117) two country-specific EFs (i.e. 323m^3 CH_4 per km of pipeline for grey cast iron and 51–75m^3 CH_4 per km for other) and the methodology for gas distribution.
E.15	1.B.2.c Venting and flaring – liquid and gaseous fuels – CO_2, CH_4 and N_2O (E.22, 2016) (E.22, 2015) Comparability	Change the relevant notation keys in CRF table 1s2 for this category from "NE" to "IE" and include the explanation of this in both the NIR and CRF table 9.	Not resolved. The Party continues to report "NE" for indirect GHGs (NOx, carbon monoxide non-methane volatile organic compounds and sulfur dioxide) in CRF table 1s2. The Party did not explain the application of the notation keys "NE" and "IE" in CRF table 9 or in the NIR. During the review the Party explained that the information will be included in the next NIR.
IPPU			
I.1	2. General (IPPU) – all GHGs (I.7, 2016) (I.7, 2015) Transparency	Report full and detailed explanations of all recalculations to the IPPU sector, providing information on changes to AD and EFs across all years and the rationale for the recalculation, and ensure that the information provided in the NIR, the CRF tables and ENINA, or any reference to the methodologies used, are internally consistent for all recalculations.	Resolved. The Party reported in its NIR (p.120) a summary of the recalculations made for the 2017 inventory submission and for each specific category provided information on changes and impact on the emission estimates.
I.2	2. General (IPPU) – all GHGs (I.8, 2016) (I.8, 2015) Transparency	In the event that recalculations affect emission sources where the underlying data are commercially confidential, strengthen QA/QC procedures and institutional arrangements to: (a) ensure that the ENINA task force can access the commercially confidential data in order to assess the recalculations and determine the time series of IEFs on a production basis (where necessary for comparability); (b) where applicable,	Addressing. The Party reported recalculations for the category (see ID# I.1 above) but did not clarify how the ENINA task force accesses commercially confidential data for QA/QC activities and obtains detailed information on EU ETS reports which are regularly assessed by the national inventory experts. The QA/QC activities were not transparently documented in the NIR.

ID[a]	Issue and or problem classification[a]	Recommendation made in previous review report	ERT assessment and rationale
		compare the annual EU ETS and/or emissions reported in the Party's AERs with recalculated inventory estimates; and (c) report on all findings of QA/QC activities transparently in the NIR, or directly provide the information to the ERT, while protecting commercially sensitive data.	
I.3	2.A.2 Lime production – CO_2 (I.9, 2016) (I.9, 2015) Completeness	Provide AD, EFs and details of the methodology used to estimate emissions from lime production in the NIR.	Not resolved. The ERT noted that the NIR (p.125) stated that CO_2 emissions from lime production (2.A.2) were included in category 1.A.2.e. food processing, beverages and tobacco. However, there was no information on AD, EFs or on the inclusion of CO_2 emissions from lime production in that category in section 3.2.5 of the NIR on manufacturing industries and construction (1.A.2). The ERT is of the view that CO_2 emissions from lime production were not included in category 1.A.2. Therefore, CO_2 emissions from lime production were either missing or could have been underestimated. The ERT believes that this issue should be considered further in future reviews to confirm that there is not an underestimation of emissions.
I.4	2.A.2 Lime production – CO_2 (I.10, 2016) (I.10, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Resolve the inconsistencies in the information provided in the NIR, the ENINA report and the notation keys in the CRF tables on the allocation of emissions from lime production.	Not resolved. See ID# I.3 above.
I.5	2.A.2 Lime production – CO_2 (I.11, 2016) (I.11, 2015) Comparability	Work with industrial operators and competent authorities to obtain additional data to enable the correct allocation of the emissions from lime production under the lime production category, in order to report in accordance with the 2006 IPCC Guidelines and to improve comparability.	Not resolved. See ID# I.3 above.
I.6	2.A.4 Other process uses of carbonates – CO_2 (I.12, 2016) (I.12, 2015) Transparency	Include the explanation of methodology choices, provide references for all data used across the time series (including for extrapolations) along with examples of validation to justify the data and methods used for all of the subcategories under other process uses of carbonates.	Resolved. The Party reported in the NIR (p.128) that category 2.A.4.d comprised three uses of limestone: power plant FGD, integrated iron and steel making, and dolomite use (mostly used in road construction). During the review the Party was able to disclose AD and EFs for the main limestone users, and the iron and steel and power plants.
I.7	2.A.4 Other process uses of carbonates (2.A.4.b soda ash)– CO_2 (I.13, 2016)	Conduct further research and consultation with industry and/or statistical agencies to either access additional AD and EFs or seek verification of the current method and	Not resolved. The Party reported in the NIR the text from the previous annual submission and did not provide information on any planned improvements for the subcategory. During the review the Netherlands provided the justification

ID#	Issue and or problem classification[a]	Recommendation made in previous review report	ERT assessment and rationale
	(I.13, 2015) Accuracy	emission estimates in order to ensure completeness and the accuracy of estimates.	that the category makes only a minor contribution to the national total for the inventory. The ERT believes that this issue should be considered further in future reviews to confirm that there is not an underestimation of emissions.
I.8	2.B.1 Ammonia production – CO_2 (I.14, 2016) (I.14, 2015) Accuracy	Estimate emissions from ammonia production taking into account CO_2 emissions and sequestration from urea production by collecting new AD (annual urea production, urea imports and exports and urea application to soils) through research and/or consultation with industry and statistical agencies in order to improve accuracy and the comparability of emission estimates.	Not resolved. The Party reported the same as in the previous annual submission, without the discount of CO_2 recovered for ammonia, which has possibly led to double counting (overestimation) as CO_2 emissions from urea consumed in automobile catalytic converters were reported. The method was assessed by the ERT and the conclusions are that: (a) The Party calculated CO_2 emissions from ammonia production without summing fuel and emissions from non-energy use of natural gas in the IPPU sector; however, this is a problem of allocation and does not mean that emissions were underestimated; (b) The Party reported non-energy use of natural gas for calculating process emissions without discounting the reaction of CO_2 recovered for urea production. The Party reported the emissions from the use of urea as "IE" (CRF table 3.H), because the estimate for CO_2 emissions from ammonia production are covered by the emissions in subcategory 2.B.1. The ERT notes that this is a problem of allocation; the emissions were estimated but not properly reported as required by the 2006 IPCC Guidelines; (c) For the energy sector, there is potential double counting because of the use of urea as a reducing agent in selective catalytic reduction of NOx in exhaust gases originating from diesel or gasoline direct injection engines, from which the emissions were reported in the energy sector. The ERT notes that the Party should be consistent in relation to CO_2 emissions from urea use: it should either not estimate the emissions under the energy and agriculture sectors, leaving all CO_2 emissions to ammonia production under the IPPU sector (not in line with IPCC guidance), or report as required by the 2006 IPCC Guidelines by deducting CO_2 from urea production in the IPPU sector under ammonia production and estimating those emissions for urea use (in the agriculture sector as fertilizer and in the energy sector as reducing agent in selective catalytic reduction of NOx).
I.9	2.B.1 Ammonia production – CO_2 (I.15, 2016) (I.15, 2015) Transparency	Document full details of the inventory data and methodologies for all categories affected in this cross-sectoral issue.	Not resolved. See ID# I.8 above.

ID[a]	Issue and/or problem classification[b]	Recommendation made in previous review report	ERT assessment and rationale
I.10	2.B.1 Ammonia production – CO_2 (I.16, 2016) (I.16, 2015) Comparability	Report CO_2 emissions from ammonia production using a method that is consistent with the 2006 IPCC Guidelines, reporting emissions from all natural gas uses (i.e. both fuel and feedstock use) within this category.	Not resolved. See ID# I.8 above.
I.11	2.B.1 Ammonia production – CO_2 (I.17, 2016) Accuracy	Review and strengthen the QA/QC procedures for this category, including by: (a) providing the ENINA task force with access to the confidential production data and derive a time series of annual production-based IEFs; (b) comparing the annual inventory and EU ETS estimates for ammonia production; and (c) reporting on the findings of QA/QC activities transparently in the submission or directly to future ERTs while protecting commercially sensitive data.	Addressing. The Party presented during the review the items required by the recommendation. However, the findings of QA/QC activities were not transparently documented in the NIR. The Party informed that for the next annual submission this will be addressed.
I.12	2.B.8 Petrochemical and carbon black production – CO_2 (I.18, 2016) (I.18, 2015) Comparability	Report emission estimates for ethylene, methanol and carbon black production under the category petrochemical and carbon black production.	Resolved. The Party reported emissions from ethylene, methanol and carbon black in category 2.B.8 in the NIR (p.137) and the CRF tables.
I.13	2.B.8 Petrochemical and carbon black production – CO_2 (I.19, 2016) (I.19, 2015) Transparency	Document the QA/QC activities and outcomes for the chemical and petrochemical sources in the IPPU sector.	Not resolved. The Party did not report QA/QC activities and outcomes for the chemical and petrochemical sources; it informed the ERT that this will be done in the next annual submission.
I.14	2.B.9 Fluorochemical production – HFCs (I.20, 2016) (I.20, 2015) Transparency	Include the procedural clarifications, provided during the review week (i.e. the process by which the operators' data in annual environmental reports are verified annually by the competent authority and then at the companies by the Dutch inventory IPPU expert) in the NIR.	Not resolved. The Party did not include the procedural clarifications in its NIR.
I.15	2.F.1 Refrigeration and air conditioning – HFCs, PFCs and SF_6 (I.21, 2016) (I.21, 2015) Comparability	Correct the notation key "NA" to "IE" for industrial refrigeration and mobile air conditioning in accordance with paragraph 37 of the UNFCCC Annex I inventory reporting guidelines.	Not resolved. The Party reported the emissions in the CRF tables in the same way as in the 2016 annual submission. During the review the Party provided disaggregated data and estimated emissions, even though this is confidential information. The ERT noted that the Party is able to report the emissions from manufacturing, stocks, disposal and recovery separately. During the review the Party clarified (as during the previous review) that it is not possible to include all information on individual sources in CRF table 2(II)B-Hs2 because of data limitations, and therefore the sum of all emissions was included

ID[b]	*Issue and or problem classification*[a]	*Recommendation made in previous review report*	*ERT assessment and rationale*
			in the field "emissions from stocks" for industrial refrigeration and mobile air conditioning.
I.16	2.F.1 Refrigeration and air conditioning – HFCs, PFCs and SF_6 (I.22, 2016) (I.22, 2015) Accuracy	Conduct QA/QC and verification of the method used to estimate emissions from refrigeration and air conditioning, in accordance with paragraph 41 of the UNFCCC Annex I inventory reporting guidelines, and report on the outcomes thereof.	Not resolved. The ERT did not find the result of QA/QC and verification of the methods in the NIR. The ERT believes that this issue should be considered further in future reviews to confirm that there is not an underestimation of emissions.
Agriculture			
A.1	3.B Manure management – CH_4 and N_2O (A.2, 2016) (A.2, 2015) (41, 2014) (52, 2013) Accuracy	Continue and enhance efforts to improve the consistency between the CH_4 and N_2O emission estimates and report correct values for the fractions of the different manure management systems in the NIR and the CRF tables.	Addressing. CRF tables 3.B(a)s2 and 3.B(b) included data on the allocation of manure for all cattle categories to manure management systems but the NIR comprised no information. During the review the Party explained that the CH_4 emission estimates are to be revised for the next annual submission with a view to ensuring consistency between the CH_4 and N_2O estimates. In a comment on the draft review report, the Netherlands provided the additional information below: (a) A new methodology for CH_4 emissions from 3.B Manure management was introduced previously; (b) The method applied (as presented in Vonk et al, 2016) uses the same MMS (liquid, solid and pasture manure) as used for the N_2O calculations; (c) Fractions of MMS in CRF table 3.B(a)s2 and corresponding values calculated from 3.B(b) differ slightly; however, this is explained as resulting from differences in rations fed during housing and grazing seasons; (d) As a result of the above changes the division of volatile solids and N excretion over the MMS also differs slightly.
A.2	3.B Manure management – CH_4 (A.5, 2016) (A.5, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Improve QC to ensure consistency between the CRF tables and the NIR when reporting on emissions from MMS.	Resolved. The Party reported complete data in CRF table 3.B(a)s2, including for horses and mules.
A.3	3.B Manure management – CH_4 (A.6, 2016) (A.6, 2015) Transparency	Enhance the methodology description of this category by providing in the NIR additional information and references on methane conversion factors and include the outcomes of the new research on B_o and methane conversion factors as soon as they become available.	Not resolved. The Party did not report additional data and references for methane conversion factors in the NIR. During the review the Party presented to the ERT details of progress made in respect of the inclusion in the estimates of the treatment of manure in anaerobic digesters and the reconsideration of the B_o and methane conversion factor values currently used in the inventory, which are planned improvements. Also the Party explained that the estimates of

ID[a]	Issue and/or problem classification[b]	Recommendation made in previous review report	ERT assessment and rationale
			CH_4 emissions from manure management are to be revised for the next inventory submission.
A.4	3.B.3 Swine – CH_4 (A.7, 2016) (A.7, 2015) Transparency	Include in the NIR the explanation of different trends between CH_4 emissions and changes in the swine population.	Addressing. The Party reported in the NIR (p.168) elements of an explanation of the CH_4 emission trend in relation to the swine population and to the evolution of other parameters used in the estimation (volatile solids and methane conversion factor). During the review the Party explained that the NIR text will be improved for the 2018 annual submission.
A.5	3.D Direct and indirect N_2O emissions from agricultural soils – N_2O (A.8, 2016) (A.8, 2015) Transparency	Include the numeric data on annual removal of agricultural crop residues in the NIR.	Not resolved. The Party did not report the numeric data on annual removal of agricultural crop residues in the NIR. During the review the Party explained that the NIR text will be improved for the 2018 inventory submission.
A.6	3.D.a Direct N_2O emissions from managed soils – N_2O (A.4, 2016) (A.4, 2015) (42, 2014) Transparency	Include the method and related parameters used to derive the country-specific N excretion and $Frac_{GRAZ}$.	Not resolved. The Party did not provide in the NIR a description of the method and related parameters used to derive the country-specific N excretion and $Frac_{GRAZ}$. During the review the Party provided a reference to the document in which the country-specific method used to derive N excretion is explained. Additionally, the Party specified that $Frac_{GRAZ}$ is based on the N excretion values included in that document and that this will be detailed further in the next annual submission. In a comment on the draft review report, the Netherlands provided the additional information below: (a) Derivation of the country-specific N excretion is described in https://www.cbs.nl/nl-nl/publicatie/2012/29/standardised-calculation-methods-for-animal-manure-and-nutrients and subsequent yearly updates (in Dutch), van Bruggen (2017) being the most recent (see https://www.cbs.nl/nl-nl/publicatie/2017/33/dierlijke-mest-en-mineralen-2016); (b) These reports are referenced in NIR and the methodology report; (c) Also, $Frac_{GRAZ}$ is no longer part of the CRF tables.
A.7	3.H Urea application – CO_2 (A.9, 2016) (A.9, 2015) Transparency	Include a section in the NIR with the information on the methodology used for the estimation of CO_2 emissions from urea application under the agriculture sector, allocation of emissions in accordance with the 2006 IPCC Guidelines and link with the reporting of emissions from ammonia production under the IPPU sector.	Not resolved. During the review the Party explained that the link with the reporting of emissions from ammonia production under IPPU is to be detailed in the NIR of the 2018 inventory submission.

ID#	Issue and or problem classification[a]	Recommendation made in previous review report	ERT assessment and rationale
LULUCF			
L.1	4. General (LULUCF) (L.1, 2016) (L.1, 2015 (table 3, 2014) (59, 2013) (120–123, 2012) Completeness	Obtain the data and report the estimates for all mandatory categories (currently reported as "NE") for which methodologies and EFs are available: (a) CSC in living biomass (gains and losses) under cropland remaining cropland; (b) CSC in DOM under land converted to cropland, except for forest land converted to cropland; (c) CSC in living biomass (losses) under wetlands, settlements and other land converted to cropland; (d) CSC in DOM under cropland, wetlands, settlements and other land converted to grassland; (e) CSC in living biomass (losses) under wetlands, settlements and other land converted to grassland; (f) CSC in living biomass (gains) under land converted to other wetlands; (g) CSC in living biomass (gains) under land converted to settlements; (h) CSC in living biomass (losses) under wetlands and other land converted to settlements; (i) CSC in living biomass (gains) under land converted to other land; (j) CSC in DOM under land converted to settlements, except for forest land converted to settlements; (k) CSC in DOM under cropland, grassland, wetlands and settlements converted to other land.	Not resolved. The Party did not provide transparent information in the NIR on why the mandatory pools of key categories were reported using the IPCC tier 1 'zero CSC' approach. There was also no information about the significance of the mandatory pools, allowing the Party to apply a tier 1 approach. During the review the Party provided some examples of a tier 1 approach being allowed. The Party stated that in the next NIR it will add information on the significance of each pool of the mandatory LULUCF categories and, in the case of significant pools, provide a justification for the application of a tier 1 approach. The ERT concluded that none of the sub-issues (a–k) had been resolved (see also ID# L.12 in table 5). The ERT notes that it is necessary, in order to solve this recommendation, for the Party to provide estimates for those mandatory and significant pools of key categories using higher-tier methodologies, for which zero CSC does not apply, as required by paragraph 4(d) of the UNFCCC Annex I inventory reporting guidelines. Further, the ERT notes that it is also necessary to provide the justification for reporting "NE" in the NIR and CRF table 9, as required by paragraphs 37(b) and 50(c) of the UNFCCC Annex I inventory reporting guidelines, for each mandatory pool of key categories for which the amount of CSC is insignificant in accordance with paragraph 37(b) of the UNFCCC Annex I inventory reporting guidelines and the 2006 IPCC Guidelines (volume 4, chapter 1, figure 1.2, footnote 4), meaning that the mandatory pool accounts for less than 25–30 per cent of the emissions or removals for the overall category. A possibility could be to include a table based on table 1.1 from Arets et al. (2017) showing all pools per category, marking which ones are significant and indicating which tier has been used. The ERT also notes that it is better for the Party to continuously improve transparency and to use higher-tier estimation methods for all pools for all mandatory key categories as required by paragraph 13 of the UNFCCC Annex I inventory reporting guidelines.
L.2	4. General (LULUCF) – CO_2 (L.3, 2016) (L.3, 2015) Comparability	Correct the notation key "NE" to "NO" for those pools in which the Party considers no CSC occurs, provide estimates for those pools and categories for which it believes zero carbon change does not apply, or provide the justification for reporting "NE" for the pools in which the	Not resolved. The Party used the notation key "NE" for pools in which the amount of CSC is insignificant (information was provided during the review), but no justification was provided in the NIR or CRF table 9. During the review, the Party informed the ERT that it will use the notation key "NE" for pools in which the amount of CSC is insignificant and will provide

ID#	Issue and/or problem classification[a]	Recommendation made in previous review report	ERT assessment and rationale
		amount of CSC is insignificant in line with paragraph 37 of the UNFCCC Annex I inventory reporting guidelines.	justification of reporting as "NE". See also ID# L.1 above.
L.3	4. General (LULUCF) – CO_2 (L.4, 2016) (L.4, 2015) Accuracy	Transparently report in the NIR which pools of key categories are significant, and obtain the data and report the estimates of emissions and removals for those significant pools under the key categories, using higher-tier methodologies.	Not resolved. See ID#s L.1 and L.2 above.
L.4	4.A.1 Forest land remaining forest land – CO_2 (L.5, 2016) (L.5, 2015) Accuracy	Calibrate the 2013 and 2014 values for CSC in living biomass per area for gains and net carbon stock change in deadwood, and take historical trends into account, to ensure the accuracy and time-series consistency in the estimates of removals.	Addressing. The Party used the EFISCEN model (www.efi.int/knowledge/models/efiscen) for the calculation of CSC starting in 2013. At a later stage, the Party will report CSC based on the next NFI. The Party reported information about the calibration and initialization of the EFISCEN model using data from the sixth Netherland Forest Inventory (2012–2013) in the methodological document Arets et al. (2017) but not in the NIR. Despite the improvements made by the Party, the ERT noted that the modelling values starting in 2013 for CSC in deadwood are probably still not accurate. The implied CSC factors for deadwood for 2013–2015 (2013 (0.233 t C/ha), 2014 (0.234 t C/ha) and 2015 (0.236 t C/ha)) are among the highest of the reporting Parties for each year. In addition, the inter-annual change between 2012 (0.058 t C/ha) and 2013 (298.4 per cent) was identified as an outlier. During the review, the Party explained that it will continue working on this issue.
L.5	4.A.1 Forest land remaining forest land – CO_2 (L.6, 2016) (L.6, 2015) Accuracy	Periodically update the CSC on land areas involving forest land as and when the new information from the next NFI becomes available.	Not resolved. During the review the Party explained that new data from the seventh NFI will be available in 2020 and that they will be used for reporting as soon as they are available. The NFI data will replace the data on CSC modelled with EFISCEN for 2013 onward. The ERT notes that transparency would be improved by making a reference to this planned improvement in the NIR (in section 6.4.6).
L.6	4.A.1 Forest land remaining forest land – CO_2 (L.7, 2016) (L.7, 2015) Transparency	Provide in the NIR an explanation of the implication of CSC in forests and the assumptions made for the estimates and provide references to justify this assumption.	Addressing. The Party reported the requested information in Arets et al. (2017). The Party also provided some additional clarification during the review. The Party explained that the harvest level is relatively stable over time, and that there was a strong increase in growing stock that is diminishing with time because the increase in annual increment is also flattening. The Party also mentioned that harvesting data are retrieved from the database of the Food and Agriculture Organization of the United Nations and that there are no 'officially registered' fellings in Dutch forests. Natural mortality is not included in the calculations as a separate process, but its effect is included in the NFI data. See ID# L.15 in table 5.

ID#	Issue and or problem classification[a]	Recommendation made in previous review report	ERT assessment and rationale
L.7	4.A.1 Forest land remaining forest land – CO_2 (L.8, 2016) (L.8, 2015) Consistency	Revise the land-use representation by correcting the increase of removals in forest land remaining forest land and by improving the consistency of reporting over time in accordance with the methodology of the 2006 IPCC Guidelines.	Resolved. The Party reported in the NIR (p.187) that the calculation of the CSC in land converted to forest land was updated using a conversion time for living biomass of 30 years, thereby resolving the issue of the abrupt increase in CSC in 2010 for forest land remaining forest land as reported in the previous NIR. The ERT agreed with this approach.
L.8	4.B Cropland – CO_2 (L.9, 2016) (L.9, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Correct the mistakes in reporting land-use area data in the CRF tables and ensure complete and consistent coverage of land areas within the country.	Not resolved. The Party reported different areas for cultivated organic soils in category 2.D.6 cultivation of organic soils (i.e. histosols) and in CRF table 4.C. During the review the Party could partially explain the difference, since the area of heathland (8.076 kha in 2015) was not considered for cultivation in CRF table 3.D.6. There is still a difference of 0.26 kha, which seems to be the result of double counting nature grassland. The Party still has to correct the double counting of nature grassland.
L.9	4.C.1 Grassland remaining grassland – CO_2 (L.2, 2016) (L.2, 2015) (45, 2014) (60, 2013) (83, 2012) Completeness	Obtain the data and report the estimates for the carbon pools (living biomass and DOM) reported as "NE", for which methods and EFs are available.	Not resolved. The Netherlands currently uses the tier 1 approach, which assumes that carbon stocks in living biomass, DOM and litter are at equilibrium (i.e. zero CSC) for most of grassland remaining grassland. The Party did not provide transparent information in the NIR on why the pools for the mandatory categories were reported using a tier 1 approach. There is also no information about their significance to justify the Party's application of a tier 1 approach.
L.10	4.C.1 Grassland remaining grassland – CO_2 (L.10, 2016) (L.10, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Correct the errors in the allocation of areas and the estimates of emissions/removals between grassland remaining grassland and land converted to grassland, and enhance the QA/QC procedures to ensure accurate reporting on this issue in the NIR and the CRF tables.	Not resolved. For 2017 the Party reported net CSC of 0.27 kt C under mineral soils for grassland remaining grassland. During the review the Party explained that, in its system, conversions from other grassland to nature grassland are recorded under grassland remaining grassland. An allocation error occurs on those units of land that are still in the 20-year transition period from other land uses to grassland. For instance, a unit of land that was converted from cropland to grassland 15 years before and then internally within the grassland category changes in designation from other to nature grassland still follows the calculations for cropland converted to grassland (and hence CSC for mineral soils is calculated), but in a later aggregation step these units of land are erroneously included in the category grassland remaining grassland. The ERT was informed that the Party will correct the aggregation step that results in the units of land being recorded under cropland converted to grassland instead of grassland remaining grassland. This will result in a change of areas and CSC for mineral soils across the grassland subcategories, but will not change the overall reported areas or CSC for the whole grassland category.

ID#	Issue and/or problem classification[a]	Recommendation made in previous review report	ERT assessment and rationale
L.11	4(I) Direct N_2O emissions from nitrogen inputs to managed soils – N_2O (L.11, 2016) (L.11, 2015) Comparability	Revise the notation key "NE" to "IE" for those indirect N_2O emissions that are reported in the agriculture sector, and provide a more transparent explanation.	Not resolved. During the review the Party stated that this recommendation will be implemented for the next annual submission.
Waste			
W.1	5.A Solid waste disposal on land – CH_4 (W.2, 2016) (W.2, 2015) (52, 2014) Transparency	Include important AD, such as the amount and composition of disposed waste, in the NIR.	Addressing. The Party reported in the NIR (p.215) the amount of waste landfilled only. The composition of waste was not included in the NIR. During the review the Party provided the amount and composition of waste landfilled throughout the time series and used in the FOD model and agreed to include the information in the next NIR.
W.2	5.A Solid waste disposal on land – CH_4 (W.7, 2016) (W.7, 2015) Transparency	Provide in the NIR an explanation of the selection of the parameters used in the FOD method, including delay time and MCF.	Addressing. The Party reported in the NIR (p.216) that the delay time used to apply the FOD model was six months and that the MCF value was one. The use of these parameters is in line with the 2006 IPCC Guidelines (volume 5, chapter 3). However, the use of an MCF of one for semi-aerobic landfills was not explained in the NIR.
W.3	5.A Solid waste disposal on land – CH_4 (W.8, 2016) (W.8, 2015) Adherence to the UNFCCC Annex I inventory reporting guidelines	Correct the notation key in CRF table 5.A in accordance with paragraph 37 of the UNFCCC Annex I inventory reporting guidelines.	Addressing. The Party continues to report "IE" for AD, EFs and emissions for semi-aerobic landfills in CRF table 5.A. The use of the notation key "IE" was not explained in the NIR. During the review the Party explained that three semi-aerobic landfills were established for research purposes only but all landfills were treated as anaerobic in the inventory.
W.4	5.A Solid waste disposal on land – CH_4 (W.9, 2016) (W.9, 2015) Transparency	Include in the NIR the background information on the use of country-specific values for the fraction of CH_4 in generated landfill gas.	Resolved. The Party reported in the NIR (p.216) the reference containing the country-specific fraction of CH_4 in landfill gas generated.(see ID# W.18 in table 5).
W.5	5.A Solid waste disposal on land – CH_4 (W.10, 2016) (W.10, 2015) Consistency	Provide justifications of: (a) why the default value of fraction of CH_4 in generated landfill gas was used for the years 2005–2014; (b) why the Party considers that the interpolation between country-specific and default values for fraction of CH_4 in generated landfill gas for the years 2001–2004 is the best approach to perform the CH_4 emission estimates and to maintain time-series consistency; and (c) how the approaches to estimate CH_4 emissions from solid waste disposal sites applied by the Netherlands correspond to the guidance provided	Addressing. During the review the Party provided reasons for the use of a combination of country-specific data and the IPCC default value for the fraction of CH_4 in landfill gas generated, but this information was not included in the NIR. During the review the Netherlands provided documentation (e.g. Tauw, 2011) and an explanation describing how the changes in Dutch policy have affected the parameter fraction of CH_4 in generated landfill gas (volume fraction). Considering that only material including substantial amounts of fat or oil can generate gas with substantially more than 50 per cent CH_4 (2006 IPCC Guidelines, volume 5, chapter 3, p.15) and the fact that rapidly degrading waste

ID[a]	Issue and or problem classification[b]	Recommendation made in previous review report	ERT assessment and rationale
		in the 2006 IPCC Guidelines. If unable to provide the justifications and if unable to obtain a country-specific value for the fraction of CH_4 in generated landfill gas for the period 2001–2014, continue to use the country-specific value (57.4 per cent) for the fraction of CH_4 in generated landfill gas, and recalculate the CH_4 emissions from waste disposal on land using the same country-specific value for the fraction of CH_4 in generated landfill gas for the entire time series 1990–2014.	components are no longer landfilled according to Dutch policy, the ERT considered satisfactory the answers provided by the Netherlands during the review.
W.6	5.B Biological treatment of solid waste – CH_4 and N_2O (W.3, 2016) (W.3, 2015) (56, 2014) Transparency	Report a complete time series of AD of separately collected organic waste from households for CH_4 and N_2O emissions from composting and digesting for the period 2009–2012.	Addressing. The Party did not include in the NIR AD for separately collected organic waste from households for CH_4 and N_2O emissions from composting and digesting for the time series 2009–2012. A link was included in the NIR (p.218) for where information on AD and EFs can be found. However, during the review, the Party provided the AD for the time series 2009–2015.
W.7	5.B.1 Composting – CH_4 (W.11, 2016) (W.11, 2015) Transparency	Ensure the consistency of the reported time series for the CH_4 EF and include in the NIR the reason for the decrease in the CH_4 EF after 2009.	Addressing. During the review the Party provided a report of the study on updating EFs for N_2O and CH_4 for composting, anaerobic digestion and waste incineration, which explained the change in the CH_4 EF and demonstrated the consistency of the time series. However, this information was not provided in the NIR.
W.8	5.B.2 Anaerobic digestion at biogas facilities – CH_4 and N_2O (W.12, 2016) (W.12, 2015) Completeness	Report emissions of CH_4 and N_2O from anaerobic digestion at biogas facilities using the available country-specific EFs to ensure complete reporting of this category.	Resolved. The Party reported in CRF table 5.B CH_4 and N_2O emissions from anaerobic digestion at biogas facilities. The information was not included in the NIR.
W.9	5.D Wastewater treatment and discharge – N_2O (W.14, 2016) (W.14, 2015) Transparency	Provide the clearly documented country-specific methodology and the background information in the NIR.	Not resolved. During the review the Party explained how emissions were calculated and provided evidence that emissions were included in the inventory. It is necessary for the Party to include those explanations in the NIR to resolve this issue.
W.10	5.D.2 Industrial wastewater – CH_4 (W.6, 2016) (W.6, 2015) (55, 2014) Accuracy	Provide a numerical estimate of the recovered CH_4 in anaerobic industrial wastewater treatment plants.	Addressing. The Party reported the amount of recovered CH_4 in the NIR (pp.222, 223 and 226) but underlined that total biogas recovery from biomass fermentation plants included in the statistics does not distinguish separately recovery according to wastewater type and plant. However, the notation keys "NA" and "NE" were reported in CRF table 5.D for the amount of CH_4 for energy recovery.
KP-LULUCF			
KL.1	General (KP-	Provide the correct areas of land in	Resolved. The Party corrected the areas of land

ID#	Issue and/or problem classification[a]	Recommendation made in previous review report	ERT assessment and rationale
	LULUCF) – all GHGs (KL.2, 2016) (KL.2, 2015) Accuracy	2013 and 2014 where necessary and include them in the land matrix.	for 2013 and 2014 in CRF table NIR-2. The areas correspond with the data provided in the other CRF tables and with the data provided in NIR table 11-1.
KL.2	General (KP-LULUCF) – CO_2 (KL.3, 2016) (KL.3, 2015) Adherence to reporting guidelines under Article 7, paragraph 1, of the Kyoto Protocol	Enhance QA/QC procedures to ensure the consistency of the information reported across the CRF tables relating to the KP-LULUCF sector, including the summary table CRF 4(KP) and tables for individual activities and background information.	Resolved. There are no longer blank cells in the KP-LULUCF CRF tables, suggesting QA/QC procedures have been improved. Information on the FMRL and total HWP from FM was reported. CRF table 4(KP) has been checked and is correct. The issue of using correct notation keys is addressed in ID# L.1 above.
KL.3	General (KP-LULUCF) – CH_4 and N_2O (KL.4, 2016) (KL.4, 2015) Transparency	Correct the notation key "NE" to "IE" for those CH_4 and N_2O emissions that are reported under organic soils, and specify the organic soils where the related CH_4 and N_2O emissions are reported.	Resolved. The Party extended the description in the NIR by stating that emissions from drainage were included under the various land-use categories and that rewetting does not occur in the Netherlands. Arets et al. (2017) provides information about the calculation of emissions from ditches (p.64) (see ID#s L.18 above and KL.14 in table 5).
KL.4	Deforestation – CO_2 (KL.5, 2016) (KL.5, 2015) Transparency	Include the justification for the high value of CSC per area of litter pool for the area of deforestation in 1990 in the NIR.	Not resolved. During the review the Party explained the high value and stated that it will include the justification in the next NIR.
KL.5	Forest management – CO_2, CH_4 and N_2O (KL.6, 2016) (KL.6, 2015) Accuracy	When the Netherlands conducts technical corrections of the FMRL, address the recommendation made in the report of the technical assessment of the FMRL submitted by the Netherlands (FCCC/TAR/2011/NLD) and reflect historical emissions from natural disturbance (see also document FCCC/IRR/2016/NLD, table 3, ID# 5).	Not resolved. During the review the Party stated that it will address this recommendation for the technical correction of the FMRL for the 2019 annual submission. (see also ID# KL.8 in table 5).
KL.6	Harvested wood products – CO_2 (KL.7, 2016) (KL.7, 2015) Transparency	Provide information on the methodologies, parameters (e.g. half-lives) and assumptions used for the estimation of CO_2 emissions from HWP; the explanation of the treatment of HWP in the NIR, including what is included or excluded as the emissions from HWP, and on which assumption their estimation is based, in accounting those emissions; and, in particular, of the adherence to IPCC guidance in terms of the exclusion of imports and deforestation, inherent HWP, and of the relationship between the reporting under the Convention and the projection of HWP in the FMRL.	Addressing. The Party extended its description of the calculation of HWP in the NIR (section 6.10). However, some information was missing, specifically related to decision 2/CMP.8 (inherited emissions, emissions accounted for in the first commitment period and exclusion of imported HWP) (see also ID# KL.11 in table 5).
KL.7	Direct and indirect N_2O emissions	Provide the reasons for the exclusion of direct and indirect N_2O emissions	Addressing. The Party did not provide information in the NIR, but reported in the

ID[a]	Issue and/or problem classification[a]	Recommendation made in previous review report	ERT assessment and rationale
	from N fertilization – N_2O (KL.8, 2016) (KL.8, 2015) Transparency	from N fertilization from the KP-LULUCF reporting.	documentation boxes of the CRF tables. The documentation box of CRF table 4(KP-II)A.2 stated that direct and indirect N_2O emissions from N fertilization under deforestation were included under the agriculture sector. Afforestation and FM were stated in the documentation box not to occur. During the review the Party explained that there is no law prohibiting fertilizer use in forests but that the application is not common practice in the Netherlands because maximizing wood production is not of high priority and, taking into account the high background atmospheric N deposition, application of additional N in forests is considered not to be economically valuable.

[a] References in parentheses are to the paragraph(s) and the year(s) of the previous review report(s) where the issue and/or problem was raised. Issues are identified in accordance with paragraphs 80–83 of the UNFCCC review guidelines and classified as per paragraph 81 of the same guidelines. Problems are identified and classified as problems of transparency, accuracy, consistency, completeness or comparability in accordance with paragraph 69 of the Article 8 review guidelines, in conjunction with decision 4/CMP.11.

IV. Issues identified in three successive reviews and not addressed by the Party

8. In accordance with paragraph 83 of the UNFCCC review guidelines, the ERT noted that the issues included in table 4 have been identified in three successive reviews, including the review of the 2017 annual submission of the Netherlands, and have not been addressed by the Party.

Table 4

Issues identified in three successive reviews and not addressed by the Netherlands

ID[a]	Previous recommendation for the issue identified	Number of successive reviews issue not addressed[b]
General		
	No such general issues were identified	
Energy		
E.1	Improve the QC procedures to ensure that all the information provided in the CRF tables and the NIR is consistent (e.g. regarding the methods used to estimate CO_2 emissions from manufacture of solid fuels and other energy industries)	4 (2013–2017)
IPPU		
	No such issues for the IPPU sector were identified	
Agriculture		
A.1	Continue and enhance efforts to improve the consistency between the CH_4 and N_2O emission estimates and report correct values for the fractions of the different manure management systems in the NIR and the CRF tables	4 (2013–2017)
A.6	Include the method and related parameters used to derive the country-specific N excretion and $Frac_{GRAZ}$	3 (2014–2017)

ID[a]	*Previous recommendation for the issue identified*	*Number of successive reviews issue not addressed[b]*
LULUCF		
L.1	Obtain data and report estimates for all mandatory categories (currently reported as "NE") for which methodologies and EFs are available: (a) CSC in living biomass (gains and losses) under cropland remaining cropland (b) CSC in DOM under land converted to cropland, except for forest land converted to cropland (c) CSC in living biomass (losses) under wetlands, settlements and other land converted to cropland (d) CSC in DOM under cropland, wetlands, settlements and other land converted to grassland (e) CSC in living biomass (losses) under wetlands, settlements and other land converted to grassland (f) CSC in living biomass (gains) under land converted to wetlands (g) CSC in living biomass (gains) under land converted to settlements (h) CSC in living biomass (losses) under wetlands and other land converted to settlements (i) CSC in living biomass (gains) under land converted to other land (j) CSC in DOM under land converted to settlements, except for forest land converted to settlements (k) CSC in DOM under cropland, grassland, wetlands and settlements converted to other land	5 (2012–2017)
L.9	Obtain the data and report the estimates for the carbon pools (living biomass and DOM) reported as "NE", for which methods and EFs are available	5 (2012–2017)
Waste		
W.1	Include important AD, such as the amount and composition of disposed waste, in the NIR	3 (2014–2017)
W.6	Report a complete time series of AD for separately collected organic waste from households for CH_4 and N_2O emissions from composting and digesting for the period 2009–2012	3 (2014–2017)
W.10	Provide a numerical estimate of the recovered CH_4 in anaerobic industrial wastewater treatment plants	3 (2014–2017)
KP-LULUCF		
	No such issues for KP-LULUCF activities were identified	

[a] The review of the 2016 annual submission was held in conjunction with the review of the 2015 annual submission. Since the reviews of the 2015 and 2016 annual submissions were not successive reviews, but were held in conjunction, for the purpose of counting successive years in table 4, 2015/2016 are considered as one year.

V. Additional findings made during the 2017 individual inventory review

9. Table 5 contains findings made by the ERT during the individual review of the 2017 annual submission of the Netherlands that are additional to those identified in table 3.

Table 5

Additional findings made during the 2017 individual review of the annual submission of the Netherlands

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and/or a problem?[a] If yes, classify by type*
General			
G.9	Inventory management	The ERT considers that there is room for improvement of the inventory management functions. During the in-country review the ERT identified that, for confidential reasons, not all underlying data used in the compilation of the inventory for the IPPU sector were available to the inventory team. Similar problems were identified when the inventory team had to collect information on the data to clarify responses to the ERT (see ID#s I.2 and I.14 in table 3 and ID#s I.17, I.24 and I.27 in table 5). The ERT considers that the archiving function of the national system may not be fully in accordance with decision 19/CMP.1, annex, paragraph 18(b). The ERT recommends that the Netherlands improve the archiving and documentation procedures in order to ensure that all necessary information used to compile the inventory is kept at the most disaggregated level in the inventory team's archiving system, together with the methods and assumptions used, and in order for the inventory team to be able to promptly retrieve the information, perform the QA/QC functions and provide the information to the ERT in a timely manner.	Adherence to reporting guidelines under Article 7, paragraph 1, of the Kyoto Protocol
G.10	NIR	The ERT noted that, for many categories, the information provided in the NIR on methods and data is not sufficient to understand how the estimates were produced (see ID#s E.5, I.2 and I.14 in table 3 and ID#s E.24, I.23, I.26, and I.27 in table 5). The ERT recommends that the Netherlands improve the general transparency of the NIR. If, in implementing recommendations in this report, the Netherlands finds that the size of the NIR would become impossible to handle, an option would be to use methodological reports as part of annex 3 to the NIR and officially submit these reports to the UNFCCC as addenda to the NIR with clear cross-references between the main body of the NIR and the methodological reports.	Transparency
G.11	QA/QC and verification	The ERT noted that the description of the institutional arrangements is insufficient to clearly understand the attributions and responsibilities of the agencies involved in the process as well as the timeline of the functions and QA/QC procedures (see ID# G.5 in table 3). During the review the Netherlands provided information on its institutional arrangements, including the QA/QC programme and plan, the emission registration workplan, the peer review report for the agriculture sector and the QA/QC procedures for outside agencies. The ERT recommends that the Netherlands improve the description of the institutional arrangements in the NIR, particularly in relation to the roles of the agencies participating in the planning, preparation and management of the GHG inventory, including task force composition. The ERT also recommends that the Netherlands include more elements of the QA/QC programme in the NIR, particularly in relation to the timeline of activities integrated with the workplan timeline.	Transparency
G.12	Follow-up to previous reviews	The ERT noted that, in accordance with paragraph 50(h) of the UNFCCC Annex I inventory reporting guidelines, Parties are required to provide information on recalculations, in particular those made in response to the review process. The Netherlands	Not an issue/problem

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem[b]? If yes, classify by type
		did provide explanations in the NIR on the recalculations done in comparison with the previous submission but did not refer to recommendations of previous review reports or to the status of their implementation. The Party reported in the NIR (p.242) that at the time of the submission of the 2017 NIR it had not received the previous review report, meaning that the reaction to the 2016 review will be included in the 2018 NIR. During the review the Party further explained that the document with the main findings provided at the end of the 2016 review week contained only the questions raised during the review and did not give an indication of which issues would result in recommendations. The ERT noted that including a table in the annual submission with the follow-up on the recommendations in chapter 10 of the NIR is very useful to keep track of the actions in response to the unsolved recommendations of all previous reviews, and encourages the Netherlands to include such a table in the NIR.	
G.13	Article 3, paragraph 14, of the Kyoto Protocol	The Netherlands reported that there have been few changes to its reporting on the minimization of adverse impacts in accordance with Article 3, paragraph 14, of the Kyoto Protocol since the previous annual submission. Nevertheless the ERT identified a significant improvement in the reporting. The Party described in more detail the steps taken to fulfil the commitments to the actions listed in paragraphs 24(a–f) of Article 7 of the Kyoto Protocol, including on energy prices, its Private Sector Investment Programme, the project Solar for Farms in Uganda/Milking the Sun, the African Biogas Partnership Program, the Energy Sector Management Assistance Programme, the Geothermal Alliance for National Geothermal Capacity Building Programme in Indonesia and other capacity-building projects. The ERT concluded that, taking into account the confirmed changes in the reporting, the information provided was complete. The ERT recommends that the Netherlands improve the transparency of the information in its NIR by describing all changes that have occurred, compared with information reported in the last annual submission.	Adherence to reporting guidelines under Article 7, paragraph 1, of the Kyoto Protocol
Energy			
E.16	1.A.1.c Manufacture of solid fuels and other energy industries – liquid fuels – CO_2, CH_4 and N_2O	The Party reported that emissions from liquid fuels were reported for 1990 only (CRF table 1.A(a)s1). During the review the Party explained that the emissions from this category occur from two emission sources: production of coke, for which solid fuels are used (blast furnace gas and coke oven gas), and production of oil and natural gas, for which gaseous fuels are used (raw natural gas). Liquid fuels are in general not used in this sector. Only in 1990 a small amount of diesel oil was used in the production of oil and natural gas. The ERT recommends that the Party include the reason why emissions from liquid fuels are reported for 1990 only in the NIR.	Yes. Transparency
E.17	1.A.1.c Manufacture of solid fuels and other energy industries – liquid fuels, gaseous fuels, other fossil fuels and biomass – CO_2, CH_4 and N_2O	The Party left the cells blank in CRF table 1.A(a)s1 for reporting emissions from liquid fuels, gaseous fuels, other fossil fuels and biomass for manufacture of solid fuels (1.A.1.c.i). The ERT recommends that the Party either estimate emissions or fill with notation keys all cells for reporting on manufacture of solid fuels (1.A.1.c.i).	Yes. Completeness
E.18	1.A.2.a Iron and steel –	The ERT noted that CO_2 emissions from iron and steel industry were allocated to manufacture of solid fuels and other energy industries (1.A.1.c), iron and steel industry (1.A.2.a), solid fuel transformation (1.B.1.b) and iron and steel production (2.C.1).	Yes. Transparency

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem?[a] If yes, classify by type
	solid fuels – CO_2, CH_4 and N_2O	It raised some questions about the completeness of reporting of CO_2 emissions from iron and steel industry. During the review the Party explained the mass balance of carbon in coke oven and blast furnaces and the allocation of the emissions in the various subcategories of the iron and steel industry. The ERT agrees with the Party's allocation of emissions to these categories; however, the explanation of their allocation should be added in the NIR to improve transparency. The ERT recommends that the Netherlands include the explanation of the allocation (e.g. mass balance of carbon in coke ovens and blast furnaces) of the emissions from iron and steel industry in its NIR.	
E.19	1.A.2.f Non-metallic minerals – biomass fuels – CO_2, CH_4 and N_2O	The Party reported that CO_2, CH_4 and N_2O emissions from biomass combusted for category 1.A.2.f non-metallic minerals were reported only for 1991 and 1992 in CRF table 1.A(a)s2. During the review the Party explained that the biomass combusted in 1991 and 1992 consisted of biogas. The estimated emissions for the years 1991–1994 were based on the 'old' energy statistics because the revision of the energy statistics for those years was not finished in time. The revision of the energy statistics for the other years (1990 and 1995–2015) was done earlier because they are more important and are used to calculate the emission estimates. However, the trend in total biogas combustion in the Netherlands is quite stable. The ERT recommends that the Party apply the revised energy statistics for 1991–1994 in order to ensure time-series consistency.	Yes. Consistency
E.20	1.A.3.d Domestic navigation – gas/diesel oil and gasoline – CO_2, CH_4 and N_2O	The Party reported that emissions from domestic waterborne navigation were recalculated using adjusted AD derived from the revised energy balance from Statistics Netherlands (NIR p.107; CRF table 1.A(a)s3). The ERT found that emissions from gas/diesel oil used for domestic navigation reported for 2014 increased from 937.47 kt CO_2 (2016 annual submission) to 1,013.61 kt CO_2 (2017 annual submission). During the review the Party explained that more fuel was reallocated from bunkers to inland navigation in the final revision of the energy balance. The ERT recommends that the Party include in the NIR an explanation for how it apportions fuel consumption from the energy balance between international bunkers and inland navigation.	Yes. Transparency
E.21	1.A.3.e.i Pipeline transport – gaseous fuels – CH_4	The Party reported figures for CO_2 and N_2O emissions but "IE" for CH_4 emissions (NIR p.97; CRF table 1.A(a)s3) for 2000–2015. The ER f noted that this is not in accordance with the 2006 IPCC Guidelines (volume 2, chapter 3.1, table 3.1.1) because the emissions from combustion which related to emissions from the operation of pump stations and maintenance of pipelines should be reported under this pipeline transport sector. During the review the Party explained that the combustion emissions of CO_2 and N_2O from the natural gas transport network were allocated to category 1.A.3.e.i pipeline transport (gaseous fuels). CH_4 emissions from gas transport were allocated to category 1.B.2.b.4 natural gas transmission and storage. The ERT recommends that the Party allocate combustion emissions of CH_4 from the natural gas transport network to category 1.A.3.e.i gaseous pipeline transport.	Yes. Comparability
E.22	1.A.4.c Agriculture/forestry/fishing – gaseous fuels – CH_4	The Party reported that the increase in the CH_4 IEF from 2005 (86.87 kg/TJ) to 2009 (319.89 kg/TJ) was due to the use of internal combustion engines in CHP plants (NIR p.110; CRF table 1.A(a)s4). During the review the Party provided an Excel spreadsheet containing the natural gas combustion in CHP plants and the EFs applied in the estimation. The Party explained that a more detailed explanation of the trend in CH_4 emissions (as a result of CHP) will be provided in the next NIR.	Not an issue/problem

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem?[a] If yes, classify by type
		The ERT encourages the Party to include the detailed explanation of the trend in the CH_4 IEF for gaseous fuels for subcategory 1.A.4.c.i agriculture/forestry/fishing – stationary.	
E.23	1.B.1.b Solid fuel transformation – solid fuels – CO_2 and CH_4	The Party reported the same AD for 2012–2015 in CRF table 1.B.1 (0.0019 Mt of fuel produced). During the review the Party explained that the AD reported for category 1.B.1.b were incorrect (old value should have been replaced) but the estimated emissions were correct. The ERT recommends that the Party correct the AD reported for 2013–2015 and ensure that AD are updated annually.	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines
E.24	1.B.2 Oil and natural gas and other – gaseous and liquid fuels – CO_2, CH_4 and N_2O	Fugitive emissions from gas and oil exploration and production (1.B.2.a.1 (CO_2, CH_4 and N_2O), 1.B.2.a.2 (CO_2 and CH_4), 1.B.2.b.1 (CO_2 and CH_4) and 1.B.2.b.2 (CO_2 and CH_4)) were reported as "IE" and the NIR stated that the emissions were included in category 1.A.1.c manufacture of solid fuels and other energy industries. The NIR stated (p.77) that combustion for category 1.A.1.c is the difference between the amount of fuel produced and sold, minus the amount of associated gas flared, vented or lost by leakage. The ERT found emissions from flaring and venting reported in category 1.B.2. However, emissions from gas lost by leakage seem to be missing from the reporting because they are not included in either category 1.A or 1.B ("IE" was reported for category 1.B (1.B.2.a.1, 1.B.2.a.2, 1.B.2.b.1 and 1.B.2.b.2) and emissions from gas lost by leakage are deducted from category 1.A.1.c). During the review the Party explained that the combined venting and flaring category (1.B.2.c.iii) includes fugitive emissions from gas lost by leakage, as reported in the AERs of the oil and gas operators. The ERT recommends that the Party report emissions from gas lost by leakage under category 1.B.2.b or, if that is not possible for the annual submission in 2018, include the explanation that fugitive emissions from gas and oil exploration and production were included with fugitive emissions from venting and flaring (1.B.2.c) in the NIR and revise CRF table 9.	Yes. Comparability
E.25	1.B.2.a Oil – liquid fuels –CO_2	The Party reported AD for refineries for 1990–2015 but CO_2 and CH_4 emissions were reported only for after 2002; and emissions for 1990–2001 were reported as "NA" (NIR p.116; CRF table 1.B.2). During the review the Party explained that the production of hydrogen generates CO_2 (CO_2 removals and a two-stage carbon monoxide shift reaction), and these emissions are included with fugitive emissions from refining/storage (1.B.2.a.4). The Party also explained that the refinery data specifying the fugitive CO_2 emissions are available and have been used since 2002, and all of the CO_2 emissions (as can be calculated from the fuel input in the refineries) were reported in category 1.A.1.b for the years 1990–2001. The ERT recommends that the Party report CO_2 emissions for the whole time series or, if that is not possible for the annual submission in 2018, change the notation keys applied to report these CO_2 emissions from "NA" to "IE" for 1990–2001 and include the explanation that CO_2 fugitive emissions from oil refining were included in category 1.A.1.b for 1990–2001.	Yes. Consistency
E.26	1.B.2.a Oil – liquid fuels –CO_2 and CH_4	The ERT found an increasing trend in CO_2 and CH_4 emissions from 2014 (952.77 kt CO_2 and 0.19 kt CH_4) to 2015 (1,258.32 kt CO_2 and 0.22 kt CH_4) for category 1.B.2.a.4 refining/storage. During the review the Party explained that the high value for 2015 was an error and includes about 300 kt CO_2 combustion emissions. The Party stated that the emissions will be allocated to the correct category (1.A) in the next annual submission. The correct figure for the fugitive emissions in 2015 is 902 kt CO_2. The Party stated that the total for combustion and fugitive emissions was correct. The ERT recommends that the Netherlands correct the CO_2 and CH_4 emission estimates for 2015 to remove the combustion-	Yes. Comparability

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem?[a] If yes, classify by type
		related CO_2 and CH_4 emissions and enhance QA/QC procedures to ensure correct reporting.	
E.27	1.B.2.b Natural gas – gaseous fuels – CO_2	Regarding category 1.B.2.b.6 (natural gas – other), the Party reported AD for this category as "IE" for the whole time series except 1990 ("NA"). CO_2 emissions were reported as "NE" for the whole time series except 1990 ("NA"), while CH_4 emissions were reported as "NO" for the whole time series (in CRF table 1.B.2). During the review the Party explained that no emissions were reported for category 1.B.2.b.6 because all known emissions were already included in other categories (1.B.2.b.1–5). The ERT believes that therefore reporting "NO" would be applicable. The ERT recommends that the Party report the appropriate notation keys in CRF table 1.b.2 for AD and CO_2 and CH_4 emissions, ensuring time-series consistency.	Yes. Comparability
E.28	1.B.2.c Venting and flaring – gas and oil – CO_2 and CH_4	The ERT noted that there was no chapter in the NIR for category 1.B.2.c venting and flaring, but CO_2 and CH_4 emissions were reported for the category. The ERT further noted that CO_2 and CH_4 emissions in CRF table 1.B.2 were reported for combined oil and natural gas venting and combined oil and natural gas flaring. During the review the Party explained that emissions from venting and flaring of oil and natural gas were reported under combined because differentiated data were not available for the oil and gas industry in the Netherlands. The ERT recommends that the Party include in the NIR a section on this category, including the methodological description of venting and flaring from oil and gas, as well as the AD and EFs.	Yes. Transparency
E.29	1.C CO_2 transport and storage – gaseous fuels –CO_2	The ERT noted that there was no section in the NIR on category 1.C CO_2 transport and storage and the category was reported as "NO" in CRF table 1.C. During the review the Party explained that CO_2 emissions from transport and storage of CO_2 do not occur in the Netherlands and therefore it used the notation key "NO". The ERT recommends that the Party investigate the existence of CO_2 emissions from CO_2 transport, injection and storage and either estimate emissions or document that they do not occur. The ERT further recommends that the Party include a section for this category in the NIR.	Yes. Completeness
IPPU			
I.17	2.A.1 Cement production – CO_2	The Party reported in the NIR (pp.125 and 126) the methods and EFs used for estimating CO_2 emissions from cement production. However, when the ERT requested the Party to provide AD, the Party informed that it was confidential information and the estimated emissions from AERs were used for the national inventory estimates. The ERT explained that primary data used in the calculations needed to be disclosed even if they are confidential information (in accordance with paragraph 13 of the annex to decision 13/CP.20 and paragraph 16(b) of the annex to decision 19/CMP.1) in order for the ERT to assess the estimation, including replicating the calculations, in accordance with the definition of transparency in the UNFCCC Annex I inventory reporting guidelines. Upon further consultation, the Party disclosed the EU ETS report where raw material AD were reported and the ERT could assess and reproduce the calculations. The ERT concluded that there was no underestimation. Nevertheless, when checking the EU ETS report, and based on the contact with the cement producer, the ERT identified a mistake, namely that sewage sludge, which belongs to the category of biomass, is not used for process	Yes. Adherence to the UNFCCC Annex I inventory reporting guidelines

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem[20] If yes, classify by type
		purposes but for energy purposes in the cement kiln. The ERT recommends that the Party correct the NIR text regarding the method for estimating emissions from cement and correct the category description by deleting methodological information regarding the use of sewage sludge.	
I.18	2.A.4 Other process uses of carbonates – CO_2	The Party reported in the NIR (p.128) that CO_2 emissions in category 2.A.4.d came from three uses of limestone: power plant FGD, integrated iron and steel making and dolomite used in road construction (mainly). During the review the Party was able to show AD and EFs for the main users, which are the iron and steel and power plants. However, of the six coal-fired power plants that consume limestone in their FGD, two do not report limestone use in their AERs. The Party explained that, after checking the emissions against the limestone use (four plants) and coal use (two plants), the sum of the CO_2 emissions from the AERs is used for the reporting in the national inventory, and this was confirmed by the ERT to be in accordance with the backwards calculations conducted by the ERT. The ERT considers that the Party should be able to demonstrate during the review the calculation done for this category. The ERT recommends that the Party enhance efforts to obtain the missing primary data on limestone consumption for the two coal-fired power plants (or confirm that carbonates are not consumed in FGD) in order to check if emissions were properly calculated and have AD to show to the ERT (in accordance with paragraph 13 of the annex to decision 13/CP.20 and paragraph 16(b) of the annex to decision 19/CMP.1) in order for the ERT to assess the estimation, including replicating the calculations, in accordance with the definition of transparency in the UNFCCC Annex I inventory reporting guidelines.	Yes. Transparency
I.19	2.B.1 Ammonia production – CO_2	The Party reported in CRF table 2(I).A-Hs1 emissions of 3,920.87 kt CO_2 for 2015. During the review the Party presented the confidential information (natural gas used not only for process but also as fuel). The ERT noted that the emissions reported for 2015 in the confidential information were not consistent with those reported in CRF table 2(I).A-Hs1. The ERT requested the Party to check which was the correct value and the Party explained that there was a database error showing the preliminary values for ammonia emissions. During the review week, the Party found the correct file for the confidential information that is consistent with the CRF tables. The ERT encourages the Party to undertake QA/QC activities for this particular category because it is a key category. The ERT also encourages the Party to document its QA/QC findings in the next NIR.	Not an issue/problem
I.20	2.B.4 Caprolactam, glyoxal and glyoxylic acid production – N_2O	The Party reported AD and EFs as confidential in the ENINA report. There was only one reference to the ENINA report in the NIR (p.137). The emission estimates for 2015 onward were based on plant-specific measurements. During the review the Party provided the confidential information for this category and presented the time-series measurements and derived EFs for 2005–2015. Also, the Netherlands explained that the emissions for 1990–2004 were calculated using an average IEF for the period 2005–2015. The ERT recommends that the Netherlands provide explanations in the NIR regarding the time series and assumptions behind the derivation of the N_2O EF used for estimating N_2O emissions from caprolactam for the two distinct time periods 1990–2004 and 2005 to the latest year.	Yes. Transparency
I.21	2.B.9 Fluorochemical	The Party did not report in the NIR or ENINA report detailed information about emissions of HFC-23 from HCFC-22	Yes. Transparency

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem?[a] If yes, classify by type
	production – HFCs	production, but disclosed confidential information during the review providing the HFC-23 load in the untreated flow based on flow meter results and stream composition. The ERT considers that this information should be provided in the NIR and/or ENINA report transparently in order to enhance transparency. During the review the ERT explained that the amount of HFCs needs to be disclosed for ERT assessment and that the type of gases should be reported separately in the CRF tables. However, the Party explained that confidential information cannot be disclosed, and therefore the ERT could not assess it. The ERT recommends that the Party report the HFC-23 load in the untreated flow based on flow meter results and stream composition in its NIR or in ENINA report, and report the type of HFCs separately in the CRF tables or, if it is difficult to conduct this recommendation soon, the ERT also recommends that the Party investigate ways to present information on AD in the NIR which demonstrate the completeness of reporting until such a time when the recommendation can be implemented.	
I.22	2.C.1 Iron and steel production – CO_2	The Party reported CO_2 emissions for category 2.C.1.c direct reduced iron in CRF table 2(I).A-Hs2. During the review the Party explained that there are two steel makers in the Netherlands: one using integrated iron and steel technology and the other EAF technology. After the presentation of a CO_2 flow by the national inventory team, the ERT clarified with national experts that the CO_2 emissions reported in CRF table 2(I).A-Hs2 referred to CO_2 emissions from EAF steel making. The ERT noted that CO_2 emissions from EAF plants should be reported under category 2.C.1.a steel instead of 2.C.1.c direct reduced iron. Actually the Netherlands does not have direct reduced iron technology in the country. The ERT recommends that the Party report CO_2 emissions from EAF steel production under category 2.C.1.a steel and clearly explain in the NIR that CO_2 emissions from EAF steel production are reported under that category in order to avoid misunderstanding. In addition, the ERT recommends that the Party report CO_2 emissions from direct reduced iron as "NO" because there are no CO_2 emissions from iron produced using that technology in the country.	Yes. Comparability
I.23	2.C.1 Iron and steel production – CO_2	The ERT noted that neither the NIR nor the ENINA report show AD and EFs for iron and steel production. The ERT asked the Party to show the confidential data that could demonstrate carbon flow in iron and steel production processes in the Netherlands. The ERT could not replicate the carbon flow estimation with the provided information because many parts of the process (sinter, pellet, flaring) were missing and carbon flows regarding basic oxygen furnace gas were not described. The ERT noted that information was missing on dry flows of reducing agents/fuels consumed, including fuel gases as inputs and on by-products, product and residue dry mass outputs with their respective carbon contents and emission figures. The ERT considers that the CO_2 emission estimation within the iron and steel industry seems correct when compared with EU ETS limited monitoring report; however, the Party's reporting of the emissions was not completely in accordance with the 2006 IPCC Guidelines and the UNFCCC Annex I inventory reporting guidelines. Additionally, the ERT noted that the NIR did not provide information on qualitative carbon flow to demonstrate that all emissions from iron and steel industry were reported under the energy and IPPU sectors. The ERT recommends that the Netherlands assess the carbon flow and carbon balance in each process in iron and steel industry in order to ensure the completeness and transparency of the reporting. Further, the ERT recommends that the Netherlands conduct QA/QC activities for the AD, as described in the 2006 IPCC Guidelines (volume 3, chapter 4.2.4.1), and provide a quantitative summary of QA/QC activities in order to demonstrate that the reporting is correct (e.g. QA/QC procedure for subcategories 2.C.1.d sinter and 2.C.1.e pellet (see issue ID# I.24 below) and for reporting the allocation to the	Yes. Accuracy

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem?[a] If yes, classify by type
		energy sector subcategories 1.B.1.b, 1.A.1.a, 1.A.2.a and1.A.1.c) and report the summary of the results of QA/QC activities (see issue ID# I.25 below).	
I.24	2.C.1 Iron and steel production – CO_2 and CH_4	The Party reported CO_2 and CH_4 emissions from pellet production as "IE" in CRF table 2(I).A-Hs2. During the review the Party explained that there has been no pellet production at the integrated iron and steel site in recent years and therefore that reporting was a mistake. The Party could not indicate precisely in which years pellet production did not occur in the country. The ERT requested the Party to assess the estimation of CO_2 emissions from sinter and pellet. The Party assessed its CO_2 emissions flow with the integrated steel maker. It was verified with experts from the industry that actually there has been some pellet production and that sinter and pellet were reported with CO_2 emissions from blast furnaces under subcategory 2.C.1.f Other non-specified. The ERT noted that the Party was not able to provide sufficient information for the ERT to assess the AD and estimate emissions, or to explain sinter and pellet production emissions. The current reporting is not in accordance with the iron and steel making subcategories in the IPPU sector reflecting CO_2 and CH_4 emissions from the processes, but the ERT noted estimation of total CO_2 emissions from iron and steel seems correct according to the information in the EU ETS report provided during the review. The ERT recommends that the Party ensure that all emissions are reported under iron and steel making subcategories in the IPPU sector, in accordance with the 2006 IPCC Guidelines.	Yes. Accuracy
I.25	2.C.1 Iron and steel production – CO_2	The ERT questioned the Party about the existence of coke oven gas flaring emissions. The explanations provided were contradictory and a CO_2 flow was presented. The Party explained that it reported coke production CO_2 emissions in the energy sector under different categories: 1.A.1.a, 1.A.1.c, 1.A.2.a and 1.B.1.b, according to the CO_2 flow evidence but could not explain whether or not coke oven gas flaring emissions were reported under subcategory 1.B.1.b. Therefore, the ERT noted that the Party was not able to demonstrate the evidence required for the ERT to assess AD and review emission estimates, and was not ready to explain coke production emissions (from the coking process, flaring, combusted in other processes internal or externally to the steel plant). The ERT recommends that the Party ensure all relevant emissions are reported under this category and clearly explain which emissions have been allocated in the energy sector and which have been allocated in the IPPU sector under iron and steel making subcategories.	Yes. Accuracy
I.26	2.F Product uses as substitutes for ozone-depleting substances – HFCs	The Party did not report any information on which species of HFCs were used for foam blowing in the NIR or the ENINA report. CRF table 2(II) showed "IE" for stocks of HFC-134a for this subapplication, which was explained by the Party as being an error. When requested by the ERT to show the confidential information for category 2.F.2 foam blowing, the Party reiterated that it was confidential and the amount of HFCs could not be disclosed to the ERT. It also explained that categories 2.F.2–2.F.5 needed to be aggregated under category 2.F.6 for reporting purposes. The ERT understands that there are only a few companies in the country that deal with fluorinated gases for foam blowing, fire protection, aerosols and solvents and that confidential requirements could limit disclosure of the information. However, the ERT noted the need for the ERT to have access to the information in order to assess the estimation, including replicating the calculations, according to the definition of transparency in the UNFCCC Annex I inventory reporting guidelines. The ERT stated that for all other subcategories (2.F.2–2.F.5) at least the species of HFCs used was disclosed in the ENINA report. The Party stated that it was an error to include	Yes. Accuracy

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and/or a problem[20] If yes, classify by type*
		details of the amount of HFCs in the ENINA report for subcategories 2.F.3–2.F.5 and that for next year the ENINA text would be reviewed and the description of those gases deleted. The Party added that it has no access to primary data. The ERT believes that this issue should be considered further in future reviews to confirm there is not an underestimation of emissions. The ERT recommends that the Party report categories 2.F.2–2.F.5 at a minimum level of aggregation in CRF tables 2(II), 2(II)B-Hs2 and 10s5 and enhance efforts to have access to primary data (per gas amount) and directly provide the information to the ERT when requested during the review or if it is difficult to conduct this recommendation soon, investigate ways to present information on AD in the NIR that demonstrates the completeness of reporting until such a time as the recommendation can be implemented.	
I.27	2.F Product uses as substitutes for ozone-depleting substances – HFCs	The Party did not report EFs for the 2.F subcategories in the NIR, only in the ENINA report, which is not an official part of the inventory submission. EFs used for HFC calculation should be described in the NIR or the ENINA report annexed to the NIR. If the latter, then all NIR text should be revised to make proper reference to the ENINA report, while avoiding complete duplication of text in the NIR and the ENINA report. The information has to be in one of the documents officially submitted to the UNFCCC. The ERT recommends that the Party either report in the NIR the EFs used for each subcategory in order to enhance transparency, or submit the ENINA report annexed to the NIR as an official submission and revise the NIR text to make proper reference to the ENINA report, while avoiding completely duplicating text in the NIR and the ENINA report.	Yes. Transparency
Agriculture			
A.8	3. General (agriculture) – CH_4 and N_2O	For the period 1990–2009, the Netherlands reported "NO" for the livestock data and emissions for mules and asses; for 2010 onward livestock data from the agricultural census were used. No explanation was provided in the inventory for the use of "NO". Responding to a question from the ERT, the Netherlands stated that in 2010 mules and asses were part of the agricultural census for the first time and that national statistics and emission estimates were not recalculated for historic years owing to the low livestock numbers. The ERT considers that the use of "NO" is not adequate as it does not reflect that a number of animals were managed in the country in the period 1990–2009. Additionally, it translated into an underestimation of emissions for the years 1990–2009. The ERT recommends that the Party collect livestock data and estimate emissions associated with mules and asses for the period 1990–2009, or, alternatively, use an extrapolation technique to ensure time-series consistency. In a comment on the draft review report, the Netherlands stated that the underestimation for the years 1990–2009 might be below the level of insignificance defined in decision 24/CP.19, annex I, paragraph 37(b).	Yes. Completeness
A.9	3. General (agriculture) – CO_2, CH_4 and N_2O	In the NIR (p.161) the evolution of swine numbers in relation to the implementation of the national policy on manure and fertilizer was presented. Additionally, it was mentioned in the NIR (p.160) that the number of other mature cattle decreased by 33 per cent from 1990 to 2015. The swine production rights instrument applied in the Netherlands and the trend in the number of other mature cattle were not sufficiently described in the NIR, but the Party provided detailed information during the review in response to questions from the ERT.	Yes. Transparency

ID[a]	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and or a problem[a2] If yes, classify by type*
		The ERT recommends that the Party include in the NIR complete descriptions of the AD and EF trends and emission estimates for other mature cattle.	
A.10	3. General (agriculture) – CO_2, CH_4 and N_2O	In the sections of the NIR on category-specific QA/QC and verification, at the subsectoral level the Netherlands included only a general description of implemented QA/QC activities. More detailed elements were provided in chapter 1 and in chapter 10 of a peer-reviewed study on the CO_2 and N_2O emissions from the agriculture sector was provided. Responding to a question from the ERT, the Party submitted the peer-reviewed report resulting from the study conducted in 2017 (Kuikman, 2017). The ERT noted that the study comprised detailed elements on the implementation of the peer review.	Not an issue/problem
		The ERT encourages the Party to include in the sections on category-specific QA/QC and verification in the NIR at the subsectoral level, detailed elements on the implementation of peer reviews: approach used, conclusions, recommendations, and description of status and approaches used to implement recommendations.	
A.11	3.A.4 Other livestock – CH_4	The Netherlands included in CRF tables 3s1 and 3.As1 only the total number of livestock under other livestock in category 3.A.4. In the NIR (p.162) the Netherlands specified that under the other livestock category it included rabbits and mink. Responding to a question raised by the ERT during the review, the Party stated that it plans to include the AD in the CRF tables separately, starting with the 2018 inventory submission.	Yes. Transparency
		The ERT recommends the Party, in order to improve the transparency of the inventory, include the data in the CRF tables distinctly for rabbits and mink as part of the inventory submission.	
A.12	3.B.5 Indirect N_2O emissions – N_2O	The Netherlands reported indirect N_2O emissions from N lost through leaching and run-off as "NO". The ERT noted that no information was provided by the Party to justify the non-occurrence of indirect N_2O emissions due to N losses from leaching and run-off and that methodologies to estimate the emissions are available in the 2006 IPCC Guidelines (volume 4, chapters 10.5.1 -10.5.3). Responding to a question from the ERT, the Party stated that in the Netherlands an action programme for the European Union nitrates directive is in force, that liquid manure is stored in cellars or silos and solid manure on concrete floors with rain covers or means to collect any run-off (either a tank or drain to another facility, like a manure cellar) and that specified related national legislation applies. It added that this prevents N leaching and run-off from animal housings and manure storage, and as a result emissions were reported as "NO" for category 3.B manure management.	Yes. Transparency
		The ERT recommends that the Netherlands explain in the NIR the implementation of national policies and how this results in the non-occurrence of indirect N_2O emissions due to N leaching and run-off.	
A.13	3.F Field burning of agricultural residues – CH_4 and N_2O	In the NIR (p.157) and in CRF tables 3s2 and 3.F, it was specified that the field burning of agricultural residues does not occur in the Netherlands. The Party did not provide information to justify that the activity is not occurring. Responding to a question from the ERT, the Party stated that the field burning of agricultural residues is not allowed in the Netherlands on the basis of Article 10.2 of the Netherlands Environmental Law; therefore, the activity does not occur and was reported as "NO".	Yes. Transparency
		The ERT recommends that the Netherlands include in the NIR the explanation that Article 10.2 of the Netherlands Environmental Law prohibits field burning of agriculture residues.	

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and or a problem?[20] If yes, classify by type*
A.14	3.H Urea application – CO_2	In CRF tables 3s2 and 3.G-I CO_2 emissions from urea application were reported as "IE". Noting the discussion in ID#I.8 in table 3, the ERT encourages the Party, in order to improve comparability in respect of the estimates of CO_2 emissions from urea application, to collect the data necessary and reallocate emissions on the basis of the categories included in the agreed CRF tables.	Not an issue/problem
LULUCF			
L.12	4. General (LULUCF) – CO_2	The Party reported that all categories of land-use change that took place before 1990 were not considered for the calculation of CSC in mineral soils because the data for before 1990 are insufficient (NIR p.185). The ERT noted that this is not in accordance with the 2006 IPCC Guidelines (volume 4, chapter 2, equation 2.25) because for all pools a transition or conversion period (20 years is most commonly used but this can be different) is applied, which means that the period before 1990 also influences the calculation of CSC for 1990 onward. During the review the Party explained that 1990 is indeed the starting point for the CSC calculation as no earlier land-use map is available. The Party showed that an extrapolation of the trend for 1990–2004 is not consistent with statistical data on land use available at the national level, which show that the permanent grassland area has continuously declined, whereas the cropland area increased before 1990, then remained constant and later slightly declined. Extending the trend from 1990–2004 to the previous period would not reflect this trend. Therefore, and given the lack of data, the Party stated that using 1990 as the starting point for calculating CSC is reasonable. The ERT agreed that using 1990 as the starting point for calculating CSC is reasonable, because extending the trend from 1990–2004 to the previous period would not reflect this trend. The Party mentioned that, for its report to facilitate the calculation of the assigned amount for the second commitment period, it estimated inherited emissions and removals from forest land converted to non-forest land for the period 1971–1989 as a correction to the contribution of emissions from deforestation that were included in the assigned amount. The ERT recommends that the Party add to the NIR the explanation of the lack of AD for before 1990 and extend the description by adding graphs showing the problem of the extrapolation of the AD back from 1990. The ERT also recommends that the Party make further efforts or explore alternative ways to derive appropriate data (e.g. through extrapolation based on surrogate data).	Yes. Transparency
L.13	Land representation	The Party reported the absolute number of land-use changes per year for 1990–2004, 2004–2009 and 2009–2013 (Arets et al., 2017, tables 3.6–3.8). The ERT noted that since 1990 there has been a steady and even remarkable increase in total land-use change: in 2009–2013 the area of land-use change amounted to 97,371 ha/year, which is more than double the area of land-use change in 1990–2004 (47,776 ha/year). The ERT also noted that the increase is specifically relevant to: (1) non-forest land converted to forest land; (2) forest land converted to non-forest land; and (3) rotations between grassland and cropland. During the review the Party explained that the different length of the period between the available land-use maps has an effect on the annualized calculated land-use changes. The long time between 1990 and 2004 means that some inter-annual changes, such as cropland to grassland rotations, are not captured. The more recent maps are more frequently updated and can better capture the short-term rotations between grassland and cropland. The Party provided information about the changes from forest land to non-forest land, referring to the Natura 2000 trajectories (http://ec.europa.eu/environment/nature/natura2000/) and also the effect of the ending of contracts with farmers. Further, the Party explained that land use is very dynamic in the	Yes. Transparency

ID[a]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem?[b] If yes, classify by type
		Netherlands; particularly the conversion between grassland and arable land is very common, but the total areas of grassland and arable land remain more or less the same. During the period 2009–2013 there was an increase in the conversion of grassland to arable land, which was due to farmers anticipating possible limitations due to the proposed permanent grassland policy of the European Union Common Agricultural Policy. The ERT found the additional information given during the review very useful for understanding the figures in the land-use change matrices. The ERT recommends that the Party provide an explanation on the increase in total land-use change in 2009–2013, including in the NIR an explanation about the inter-survey period of the AD and the rotation frequency, and provide a qualitative description referring to relevant policies (e.g. Natura 2000 or the European Union Common Agricultural Policy) with respect to annual land-use change in total, from non-forest land to forest land and from forest land to non-forest land and rotations between grassland and cropland. The ERT also recommends that the Party use the same format for the land-use change matrices as in CRF table 4.1 and CRF table NIR-2 in order to avoid confusion in future annual submissions.	
L.14	Land representation	The Party reported that the calculation of CSC was based on a very high resolution observation using trajectories (minimum area of half a pixel; Arets et al. (2017), chapter 3.6). Activities under the Kyoto Protocol were recorded on a pixel basis (Arets et al. (2017), chapter 3.7). The ERT asked for additional explanation concerning the application of trajectories and the spatial resolution used for reporting under the Convention and for KP-LULUCF accounting because the description in the NIR of how land-use trajectories are dealt with was confusing. During the review the Party explained and confirmed that the resolution of the land-use maps used for reporting LULUCF under the Convention and accounting for KP-LULUCF was identical. The same 25 x 25 m raster maps and land-use changes were assessed on a pixel basis. The ERT encourages the Party to extend and improve the description in the NIR, for example by adding the explanation and figures provided during the review.	Not an issue/problem
L.15	4.A.1 Forest land remaining forest land – CO_2	The calculation of CSC in living biomass in forest land remaining forest land was described in the NIR (p.196) and in Arets et al. (2017) (p.31). The ERT noted that the description was limited and confusing and thus not in accordance with paragraph 50 of the UNFCCC Annex I inventory reporting guidelines, which states the mandatory content of the NIR. During the review the Party explained the steps taken to calculate CSC in living biomass by showing graphs of the used data (values from the national NFI combined with harvesting data from the database of the Food and Agriculture Organization of the United Nations). In discussions during the review it became clear that the description of the calculation from volume units into mass units by applying allometric functions (biomass conversion and expansion functions) and biomass conversion and expansion factors was not straightforward. During the review the Party showed the ERT details of the temporal development of growing stock, net annual increment and carbon stock in deadwood and provided additional information on historical developments and forestry-related policies explaining these trends. The ERT recommends that the Netherlands correct and extend the description of the calculation steps for CSC in living biomass and provide additional information on the primary data sets used (e.g. tables or graphs containing gains and losses of biomass for the whole time series). Further the ERT encourages the Party to add a qualitative description or an interpretation of the values shown in table 4.2 of Arets et al. (2017), more specifically explaining the temporal development of growing	Yes. Transparency

ID[1]	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem[2]? If yes, classify by type
		stock, net annual increment and carbon stock in deadwood and the policies related to those processes.	
L.16	4.C Grassland – CO_2	The Party described that orchards are covered by the grassland category and do not fall under the forest definition. However, the carbon stock of orchards was not reported (NIR p.191). The ERT noted that this is not in accordance with the 2006 IPCC Guidelines (volume 4, chapter 2.3.1.2) and that CSC of orchards are missing from the Party's reporting. The CSC of orchards is relevant in the case of land-use change: missing of carbon losses in living biomass is possible when orchards are converted to another land-use category or another grassland category thereby removing the above-ground living biomass. During the review the Party explained that orchards are not classified separately on the land-use maps from which the AD are derived. Therefore, the Party cannot take the CSC in orchards converted from and to other categories into account. The Party also explained that orchards cover a relatively small area (approximately 20 kha) and that it is working on a more detailed categorization of grassland, to move from the tier 1 to tier 2 approach for calculating biomass for grassland. The ERT recommends that the Party estimate CSC in orchards according to methods provided in the 2006 IPCC Guidelines and provide information in the NIR on the method applied.	Yes. Completeness
L.17	4.C.2 Land converted to grassland – CO_2	The Party reported annual CSC in mineral soils for cropland converted to grassland in CRF table 4.C.2.2. The ERT identified the following inter-annual changes in the IEF for mineral soils in cropland converted to grassland as outliers: 2003/2004 (–2.7 per cent), 2008/2009 (–4.5 per cent), 2009/2010 (–4.5 per cent), 2010/2011 (–4.2 per cent) and 2011/2012 (–3.7 per cent). During the review the Party explained that the inter-annual changes in the trends in the carbon flux per ha are due to changes in the trends in land-use change because the changes are calculated as the difference between stocks for consecutive years. The Party applied stocks per ha, which are relatively constant over time and depend on land-use and soil type. The Party illustrated that the calculated rate of stock change, however, reflects the trend in the land-use change and how this is distributed over different soil types. The Party concluded that these trends show changes in direction with each land-use map that is available (for 2004, 2009 and 2013). The ERT welcomes the information provided during the review and recommends that the Party include an explanation of the inter-annual changes in the IEF for mineral soils in cropland converted to grassland in the NIR.	Yes. Transparency
L.18	4(II) Emissions and removals from drainage and rewetting and other management of organic/mineral soils – CO_2 and N_2O	The Party reported that drainage is not frequently applied in forestry in the Netherlands (NIR p.198; CRF table 4.A). In CRF table 4.A it is shown that 6 per cent of forests are on organic soils. Arets et al. (2017) (p.199) describes the groundwater lowering in the Netherlands, stating that more land is now drained compared with in the 1960s. The NIR (p.254) stated that the majority of the conversions from non-forest land to forest land on organic soils are on agricultural land. The ERT noted that this is not in accordance with the 2006 IPCC Guidelines (volume 4, chapter 2, figure 2.5) because, although drainage of organic soils to sustain forestry is not part of the present land management, it is possible that the old drainage systems from the agricultural sites are still active if they have not been actively been put out of service. For the establishment of other forest sites, sites might have been drained before. During the review the Party explained that it does not have information on the location of drainage systems. The Party showed that part of the forests on organic soils are located in nature areas with forest swamps (Wieden-Weerribben and De Groote Peel), where it is highly unlikely that these areas are drained. The Party confirmed that for other forest areas it is possible that	Yes. Completeness

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem? If yes, classify by type
		old drainage systems or drainage of nearby agricultural areas results in CO_2 emissions. The Party proposed delineating the forest on organic soils that is unlikely to have drainage and deriving from that the area of forest on organic soils where drainage might still be active and calculating the emissions due to drainage for those areas (i.e. CO_2 emissions reported in CRF table 4 using the IPCC default EF from the Wetlands Supplement (table 2.1) and N_2O emissions reported in CRF table 4(II) using the IPCC default EF provided in the Wetlands Supplement (table 2.5)). The ERT recommends that the Party provide estimates of the areas of forest land on organic soils where drainage might still be occurring, report the associated CO_2 and N_2O emissions in the CRF tables using IPCC default or country-specific EFs and describe the applied methodology and IEF transparently in the NIR.	
L.19	4(V) Biomass burning – CO_2, CH_4 and N_2O	The Party reported CO_2, CH_4 and N_2O emissions from forest fires calculated on the basis of available fuel (NIR p.198). The ERT noted that this is not in accordance with the 2006 IPCC Guidelines (volume 4, chapter 2, equation 2.27). Generally, the NFI should be able to detect all changes in living biomass, including losses owing to forest fires. Consequently, CO_2 emissions owing to forest fires should already be included in changes in biomass in CRF table 4.A and thus there might be a potential double counting of emissions from biomass burning in forests. During the review the Party explained that the data on available fuel is based on the average biomass in forest land remaining forest land. Burned sites are part of the NFI. However, in the Netherlands forest fires are very infrequent and mostly cover only small areas, thereby having a relatively mild impact on biomass. As a result the Party assesses that forest fires have a limited effect on the data in the NFI. The ERT agrees with this explanation and recommends that the Party include the methodological description in the NIR, providing information on how the NFI covers forest fires, showing how this is marginally reflected in the calculation of the available fuel and explaining the unlikeliness of double counting.	Yes. Transparency
Waste			
W.11	5.A.1 Managed waste disposal sites – CH_4	The Netherlands applied the FOD model to estimate CH_4 emissions from anaerobic managed solid waste disposal sites. The ERT noted that this is in line with the 2006 IPCC Guidelines as managed waste disposal sites was identified as a key category. However, in CRF table 5.A the Party used the notation key "IE" for semi-aerobic, which suggests that semi-aerobic landfills exist in the country. In response to a question raised by the ERT during the review, the Party clarified that three semi-aerobic landfills were established in the Netherlands for research purposes in order to conduct scientific tests on the possibility of using semi-aerobic landfills in the future. The Party demonstrated that the three managed semi-aerobic landfills were treated as anaerobic managed disposal sites when applying the FOD model (e.g. an MCF of 1 was applied instead of 0.5). The ERT recommends that the Party report in the NIR that CH_4 emissions from semi-aerobic landfills are included with the emissions from managed solid waste disposal sites to clarify the use of the notation key "IE".	Yes. Transparency
W.12	5.A.1 Managed waste disposal sites – CH_4	AD on the amount of waste landfilled were provided for the time series 1945–2015 in the NIR (p.215, table 7.2). The ERT found that this information was not transparent enough to understand how the AD were derived. During the review the Party provided information on the types of waste sent to landfills, the approach used to collect data (including, for example, questionnaires sent to landfill operators to collect site-specific data) and the waste composition.	Yes. Transparency

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and/or a problem?[a] If yes, classify by type
		The ERT recommends that the Netherlands provide in the NIR information describing the types, composition and amount of waste landfilled and how the AD for the time series 1945–2015 were compiled.	
W.13	5.A.1 Managed waste disposal sites – CH_4	The ERT found that the data provided in NIR table 7.3 (p.217), in particular the waste generation rate (kg/cap/day), suggest that industrial solid waste and sludge (including domestic and industrial sludge) were not included in the inventory. During the review the Party clarified that the waste generation rate in NIR table 7.3 was not used to determine the amount of waste sent to landfill but provided for information only. The ERT found it confusing to include this information in the NIR, without further explanation, while the AD used to estimate emissions were site specific.	Yes. Transparency
		The ERT recommends that the Party include in the NIR the data used for the estimation of emissions only (e.g. exclude the waste generation rate reported in NIR table 7.3), together with a detailed explanation.	
W.14	5.A.1 Managed waste disposal sites – CH_4	The waste composition data used by the Netherlands to derive the DOC values (NIR p.215, table 7.2) were not provided in the NIR, making it difficult to understand the DOC values. During the review the Party provided data on waste composition and the approach, including expert judgment, used to derive the DOC values for the time series 1990–2015.	Yes. Transparency
		The ERT recommends that the Netherlands include in the NIR data on waste composition and the method applied to derive the DOC values.	
W.15	5.A.1 Managed waste disposal sites – CH_4	The ERT observed a decrease in DOC throughout the time series 1990–2015, in particular a large decrease in DOC value from 11 per cent in 2000 to 6.2 per cent in 2001 (43.6 per cent decrease). The ERT underlined that the DOC values reported by the Netherlands for the period 2000–2015 were all lower than the lower limit of the default range (0.12–0.28) of the 2006 IPCC Guidelines. During the review, the Netherlands provided documentation (Tauw, 2011) explaining that the waste components, including dredging spoils, residues from waste incineration, contaminated soils and stones, with very low carbon contents were included in the waste stream after 1995 while large amounts of organic waste (food, oil, fat, garden waste, etc.) were incinerated, reducing the DOC content of the bulk waste.	Yes. Transparency
		The ERT recommends that the Netherlands report in the NIR the reasons for the decrease in DOC values throughout the time series, in particular between 2000 and 2001, and explain the low values reported for the period 2000–2015.	
W.16	5.A.1 Managed waste disposal sites – CH_4	The Party used a country-specific k value (0.0693) for the period 1990–2000 and the default value from the 2006 IPCC Guidelines (0.05) for the period 2005–2015. For between 2001 and 2004 the Party applied simple interpolation. The ERT identified that deriving k values (i.e. half-life values ($t_{1/2}$)) by simple interpolation is not in line with the 2006 IPCC Guidelines because k is a function of a wide variety of factors, such as climatic conditions at the landfill site, characteristics of the landfills, waste disposal practices, composition of waste, etc., which are difficult to interpolate. Furthermore, the reasons for the use of the IPCC default k value for 2000–2015 were not clearly reported in the NIR. During the review, the Netherlands provided documentation (e.g. Tauw, 2011) and explanation describing how the changes in Dutch policy have affected the waste composition and the parameter k. The analysis of the documentation and explanation provided by the Netherlands suggest that: (a) Historical landfills and current landfills are all in the same climatic conditions;	Yes. Consistency

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem?[20] If yes, classify by type
		(b) Waste composition has changed since the 1990s, in particular: (i) There has been a reduction in rapidly degrading waste sent to landfills (food, garden waste, other organic (oil, fat, etc.) are incinerated with energy recovery); (ii) Waste sent to landfills has a low DOC (dredging waste, residues from waste incineration, contaminated soils and stones, etc.); (iii) Moderately degrading and slowly degrading waste are the dominant waste types in landfills. The ERT identified that the explanation provided by the Netherlands is in accordance with the 2006 IPCC Guidelines and recommends that the Netherlands apply country-specific k values for the period 2001 onwards in order to ensure time-series consistency and, until the studies for obtaining these country-specific k values are concluded, the ERT recommends that the Netherlands apply: (a) The country-specific value for k (0.0693) for the period 1990–2004; (b) The IPCC default value (0.05) for k for 2005 onward until new country-specific data are available. Furthermore, the ERT recommends that the Netherlands explain in the NIR the use of the k values throughout the time series.	
W.17	5.A.1 Managed waste disposal sites – CH_4	The DOC_f used by the Netherlands was a country-specific value (0.58) for the period 1990–2000 and the default value (0.5) from the 2006 IPCC Guidelines for 2005–2015. For between 2001 and 2004 the Party applied interpolation. The ERT found that the reasons that led the country to decide to move from the country-specific data to the IPCC default value were not included in the NIR. In response to a question raised by the ERT during the review, the Netherlands provided documentation (e.g. Tauw, 2011) and explanation describing how the changes in Dutch policy have affected the waste composition and the parameter DOC_f (see ID# W.16 above). Considering the analysis of documentation made above, the ERT recommends that the Party derive country-specific DOC_f values for the period 2001 onward in order to ensure time-series consistency and, until the studies for obtaining these country-specific DOC_f values are concluded, the ERT recommends that the Netherlands apply: (a) The country-specific value for DOC_f (0.58) for the period 1990–2004; (b) The IPCC default value (0.5) for DOC_f only for 2005 onwards. Furthermore, the ERT recommends that the Netherlands explain in the NIR the use of the DOC_f values throughout the time series.	Yes. Consistency
W.18	5.A.1 Managed waste disposal sites – CH_4	The Netherlands used a country-specific fraction of CH_4 in generated landfill gas (57.4 per cent) for the period 1990–2000 and the default value (50 per cent) from the 2006 IPCC Guidelines for 2005–2015. The Party applied simple interpolation to estimate the values for 2001–2004. The ERT found that deriving the fraction of CH_4 in generated landfill gas by interpolation is not in line with the 2006 IPCC Guidelines as fraction of CH_4 in generated landfill gas is a function of multiple parameters (see ID# W.16 above) that are difficult to derive by simple interpolation. Also, the ERT identified that no information was provided in the NIR by the Netherlands to justify the change from country-specific data (57.4 per cent) to the default (50 per	Yes. Consistency

ID#	Finding classification	Description of the finding with recommendation or encouragement	Is finding an issue and or a problem?[a] If yes, classify by type
		cent) from the 2006 IPCC Guidelines. During the review, the Netherlands provided documentation (e.g. Tauw, 2011) and an explanation describing how the changes in Dutch policy have affected the waste composition and the parameter fraction of CH_4 in generated landfill gas (see ID# W.16 above). Considering that only material including substantial amounts of fat or oil can generate gas with substantially more than 50 per cent CH_4 (2006 IPCC Guidelines, volume 5, chapter 3, p.15) and the fact that rapidly degrading waste components are no longer landfilled according to Dutch policy, the ERT considered satisfactory the answers provided by the Netherlands during the review. The ERT recommends that the Party derive country-specific fraction of CH_4 in generated landfill gas values for the period 2001 onwards in order to ensure time-series consistency and, until the studies for obtaining these country-specific values are concluded, the ERT recommends that the Netherlands apply: (a) the country-specific value (57.4 per cent) for the period 1990–2004; (b) the IPCC default value (50 per cent) for 2005 onwards. Furthermore, the ERT recommends that the Party explain in the NIR the use of the fraction of CH_4 in generated landfill gas value throughout the time series from 1990.	
W.19	5.D Wastewater treatment and discharge – CH_4	The Netherlands presented in the NIR (p.223, table 7.5) data and parameters on wastewater handling. However, it was difficult for the ERT to understand how the DOC values for wastewater and sludge were derived. During the review the Party explained that the DOC data were determined by measurements and provided the values. The ERT recommends that the Party include in the NIR detailed data on DOC for domestic and industrial wastewater and sludge and describe how the data were derived (see table 7.5, p.223, of the NIR).	Yes. Transparency
KP-LULUCF			
KL.8	General (KP-LULUCF)	The Party described the calculation of the background level and margin to exclude natural disturbances for afforestation and FM. The Party provided the time series of natural disturbances and described the results of the interactive steps in the NIR (p.262). The ERT could not check if the background level and margin were calculated in accordance with the Kyoto Protocol Supplement (pp.2.49–2.58) because the values for the background value and the margin were not reported separately. During the review the Party explained that the calculation was based on area-specific emissions and that during the iterative process 1990 and 2007 with emissions resulting from wind storms (FM only) were identified as outliers and excluded from the calculations. The results of the iterative process were: (a) Afforestation: background value: 0.0067 kt CO_2 eq; margin: 0.0055 kt CO_2 eq; (b) FM: background value: 2.377 kt CO_2 eq; margin: 2.004 kt CO_2 eq. The ERT accepted the reported information. The ERT recommends that the Party extend the information provided in the NIR such that the calculation process for the background level and margin to exclude natural disturbances is documented transparently showing that the calculation is based on area-specific emissions and that the background value and margin for both afforestation and FM were provided separately (not summed).	Yes. Transparency

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and or a problem?[20] If yes, classify by type*
KL.9	Afforestation and reforestation – CO_2	The Party reported in the NIR (p.251) that CSC in litter and deadwood were not reported for AR. The ERT noted that this is not consistent with CRF table NIR-1, where the notation key "R" ("reported") was reported for those pools. CSC for litter is reported as "NE" in the NIR (p.251, table 11.3) and as "NO" in CRF table 4(KP-I)A.1". However, the ERT noted that CSC for deadwood is not zero. The inconsistency between the values shown in the NIR and CRF table 4(KP-I)A.1 for 2015 was acknowledged by the Party during the review. The ERT recommends that the Party ensure consistency between the values provided in the CRF tables and in the NIR and correct errors where needed. The ERT also recommends that the Party correct the use of the notation keys and use them consistently throughout the NIR (i.e. use "NR" ("not reported") for pools where the tier 1 'not a source principle' applies and for which a justification has be given in the NIR).	Adherence to reporting guidelines under Article 7, paragraph 1, of the Kyoto Protocol
KL.10	Afforestation and reforestation – CO_2	The ERT noted that there is not a clear description of the applied conversion times for all pools for AR and that there is inconsistency between the values shown in the NIR (table 11.3) and CRF table 4(KP-I)A.1 for 2015. During the review the Party agreed that the description in the NIR (p.251) (see ID# KL.9 above) is not conclusive. It explained the calculation of CSC for litter and deadwood, which is different for afforestation of forest younger than 20 years and afforestation of forest older than 20 years. The Party also explained the application of the conversion times of 30 years for living biomass and 20 years for the other pools. The ERT noted these facts has not been stated in the NIR. The ERT recommends that the Party improve the description in the NIR of the applied methodology and IEF, differentiating between afforestation of forest younger than 20 years and afforestation of forest older than 20 years for litter and deadwood. Similarly, the ERT recommends that the Party transparently reported in the NIR the estimation method applied and the IEF for living biomass for afforestation of forest younger and older than the applied conversion time of 30 years.	Yes. Transparency
KL.11	Harvested wood products – CO_2	The Party reported in the NIR (p.210, section 6.10.2) that, for the calculation of HWP, four categories were taken into account. The Party used the same methodology from the Kyoto Protocol Supplement for reporting under the Convention (LULUCF sector) and for accounting under the Kyoto Protocol. Besides the three default categories, the Party also created the category other, applying a half-life of 35 years, similar to the category sawn wood. The ERT noted that the category other is not defined or described and there is no justification for using the applied half-life. During the review the Party explained that the category other covers the use of whole stems as piles in building foundations and in road and waterworks and for use in fences and as poles. Therefore, the application of a 35-year half-life is appropriate. The ERT recommends that the Party include in the NIR the definition of the category other and the provided justification for the applied half-life.	Yes. Transparency
KL.12	Harvested wood products – CO_2	The Party described the used methodology for the calculation of HWP in the NIR (p.210) and also in the methodological background document (Arets et al., 2017). However, the description is limited to the mandatory elements for reporting as required by decision 2/CMP.8, annex II, paragraph 2(g), and does not enable the ERT to fully understand the processes behind the HWP results. During the review the Party provided figures and tables showing the inflow and outflow of the HWP pool. The ERT encourages the Party to include in the NIR information on primary data such as the calculation of the inflow and outflow of the HWP pool.	Not a problem

ID#	*Finding classification*	*Description of the finding with recommendation or encouragement*	*Is finding an issue and/or a problem?[a] If yes, classify by type*
KL.13	Forest management – CO_2	The Party did not report CSC for litter and mineral soils under FM (NIR p.185, p.252 and CRF table 4(KP-I)B.1) (carbon stock change reported as "NO"). According to the Kyoto Protocol Supplement (p.2.23), a Party may choose not to account for a given pool if transparent and verifiable information is provided to show that the pool is not a source. The ERT could not find such a justification for CSC for litter and mineral soils under FM in the NIR. During the review the Party provided data justifying the assumption of the litter pool not being a source. The Party presented a Monte Carlo assessment from archived litter data based on a report by De Waal et al. (2012). The Party also provided an internal document (Mol et al., 2011), which includes an argumentation as to why mineral soils in Dutch forests are assumed not to be a source. The document shows the results of Dutch measurements at the measuring station in Loobos, national N retention data combined with dynamic modelling, chronosequences of European data and a literature overview of European studies on dynamic soil modelling. The ERT welcomes the justification provided for both carbon pools and recommends that the Party include reference documents in the NIR (in section 11.3.1.2) in order to demonstrate that for litter and mineral soils in Dutch forests the 'not a source' approach can be applied. The ERT encourages the Party to periodically update the internal document (Mol et al., 2011) with regard to the screening of the applied reporting methods of other countries and especially with regard to provided arguments from international literature on soil modelling, since some of the references (e.g. Liski et al., 2002) can be replaced by more recent studies.	Yes. Transparency
KL.14	CH_4 and N_2O emissions from drained and rewetted organic soils – CH_4 and N_2O	The Party reported in the NIR (p.198) that drainage is not frequently applied in forestry in the Netherlands (see ID# L.18 in above). Around 12 per cent of the afforestation area (CRF table 4(KP-I)A.1) and 6 per cent of the area under FM (CRF table 4(KP-I)B.1) is on organic soils. During the review, the Party proposed delineating the areas of afforestation and FM on organic soils that are unlikely to have drainage and deriving from that the forest areas on organic soils where drainage might still be active and calculating the emissions due to drainage for those areas (i.e. CO_2 emissions reported in CRF table 4(KP-I)A.1 and CRF table 4(KP-I)B.1 using the IPCC default EF from the Wetlands Supplement (table 2.1) and N_2O emissions reported in CRF table4(II) using the IPCC default EF provided in the Wetlands Supplement (table 2.5). The ERT accepts the proposed procedure. The ERT recommends that the Party provide estimates of the areas of afforestation and FM on organic soils where drainage might still be active, report the associated CO_2 and N_2O emissions in the CRF tables using IPCC default or country-specific EFs and describe the applied methodology and IEF transparently in the NIR.	Yes. Completeness

[a] Recommendations made by the ERT during the review are related to issues as defined in paragraph 81 of the UNFCCC review guidelines, or problems as defined in paragraph 69 of the Article 8 review guidelines. Encouragements are made to the Party to address all findings not related to such issues or problems.

VI. Application of adjustments

10. The ERT has not identified the need to apply any adjustments to the 2017 annual submission of the Netherlands.

VII. Accounting quantities for activities under Article 3, paragraph 3, and, if any, activities under Article 3, paragraph 4, of the Kyoto Protocol

11. The Netherlands has elected commitment period accounting and therefore the issuance and cancellation of units for KP-LULUCF activities is not applicable for the 2017 review.

VIII. Questions of implementation

12. No questions of implementation were identified by the ERT during the review.

Annex I

Overview of greenhouse gas emissions and removals for the Netherlands for submission year 2017 and data and information on activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol, as submitted by the Netherlands

1. Tables 6–9 provide an overview of total GHG emissions and removals as submitted by the Netherlands.

Table 6

Total greenhouse gas emissions for the Netherlands, base year[a]–2015

(kt CO_2 eq)

	Total GHG emissions excluding indirect CO_2 emissions		*Total GHG emissions including indirect CO_2 emissions[b]*		*Land-use change (Article 3.7 bis as contained in the Doha Amendment)[c]*	*KP-LULUCF activities (Article 3.3 of the Kyoto Protocol)[d]*	*KP-LULUCF activities (Article 3.4 of the Kyoto Protocol)*	
	Total including LULUCF	*Total excluding LULUCF*	*Total including LULUCF*	*Total excluding LULUCF*			*CM, GM, RV, WDR*	*FM*
FMRL								–1 425 00
Base year	228 447.62	222 387.18	229 113.58	223 053.14	752.27		NA	
1990	226 811.17	220 750.73	227 477.14	221 416.70				
1995	237 260.61	231 044.97	237 730.01	231 514.37				
2000	225 422.92	219 378.41	225 758.69	219 714.18				
2010	220 056.82	213 921.63	220 293.37	214 158.17				
2011	206 237.60	200 030.03	206 468.96	200 261.38				
2012	201 475.08	195 215.55	201 702.64	195 443.12				
2013	202 059.39	195 406.58	202 273.43	195 620.62		763.36	NA	–1 425.15
2014	194 047.67	187 372.78	194 257.30	187 582.41		740.84	NA	–1 415.31
2015	201 749.50	195 038.63	201 956.54	195 245.67		717.46	NA	–1 390.78

Notes: Totals include indirect CO_2 emissions reported in CRF table 6.

[a] Base year refers to the base year under the Kyoto Protocol, which is 1990 for CO_2, CH_4 and N_2O and 1995 for HFCs, PFCs, SF_6 and NF_3. The Netherlands has not elected any activities under Article 3, paragraph 4, of the Kyoto Protocol. For activities under Article 3, paragraph 3, of the Kyoto Protocol and FM under Article 3, paragraph 4, only the inventory years of the commitment period must be reported.

[b] The Party has reported indirect CO_2 emissions in CRF table 6.

[c] The value reported in this column refers to 1990.

[d] Activities under Article 3, paragraph 3, of the Kyoto Protocol, namely AR, and deforestation.

Table 7

Greenhouse gas emissions by gas for the Netherlands, excluding land use, land-use change and forestry, 1990–2015

(kt CO_2 eq)

	CO_2[a]	CH_4	N_2O	HFCs	PFCs	*Unspecified mix of HFCs and PFCs*	SF_6	NF_3
1990	162 937.25	32 316.45	17 687.11	5 606.33	2 662.85	NO	206.70	NO, IE
1995	173 327.99	30 332.97	17 741.08	7 571.44	2 279.92	NO	260.97	NO, IE
2000	171 985.93	25 090.46	15 711.14	4 765.06	1 902.81	NO	258.78	NO, IE
2010	182 782.15	20 116.21	8 125.93	2 666.32	313.77	NO	153.79	NO, IE
2011	169 946.03	19 555.50	7 933.25	2 426.24	275.20	NO	125.17	NO, IE
2012	165 767.50	19 174.15	7 753.81	2 386.72	188.45	NO	172.50	NO, IE
2013	165 788.58	19 161.79	7 960.14	2 446.49	143.76	NO	119.86	NO, IE
2014	158 252.63	18 784.43	8 065.33	2 252.21	93.21	NO	134.59	NO, IE
2015	165 334.28	19 000.75	8 331.87	2 335.72	104.22	NO	138.83	NO, IE
Per cent change 1990–2015	**1.5**	**–41.2**	**–52.9**	**–58.3**	**–96.1**	**NA**	**–32.8**	**NA**

Note: Emissions/removals reported in the sector other (sector 6) are not included in total GHG emissions.

[a] CO_2 emissions include indirect CO_2 emissions reported in CRF table 6.

Table 8

Greenhouse gas emissions by sector for the Netherlands, 1990–2015

(kt CO_2 eq)

	Energy	*IPPU*	*Agriculture*	*LULUCF*	*Waste*	*Other*
1990	156 472.72	25 445.29	25 314.77	6 060.44	14 183.92	NO
1995	167 781.63	26 624.45	24 528.35	6 215.64	12 579.93	NO
2000	165 959.23	22 686.72	21 243.78	6 044.51	9 824.44	NO
2010	178 800.40	12 353.09	18 495.31	6 135.20	4 509.37	NO
2011	165 753.75	12 590.90	18 173.86	6 207.57	4 242.88	NO
2012	161 544.46	11 913.09	17 970.34	6 259.52	4 015.24	NO
2013	161 583.45	11 775.34	18 447.22	6 652.81	3 814.62	NO
2014	154 202.56	11 184.22	18 616.70	6 674.89	3 578.93	NO
2015	160 993.08	11 663.43	19 210.26	6 710.87	3 378.91	NO
Per cent change 1990–2015	**2.9**	**–54.2**	**–24.1**	**10.7**	**–76.2**	**NA**

Notes: (1) Emissions/removals reported in the sector other (sector 6) are not included in total GHG emissions. (2) Totals include indirect CO_2 emissions reported in CRF table 6.

Table 9

Greenhouse gas emissions/removals from activities under Article 3, paragraphs 3 and 4, of the Kyoto Protocol by activity, base year[a]–2015, for the Netherlands

($kt CO_2 eq$)

	Article 3.7 bis as contained in the Doha Amendment[b]	*Article 3.3 of the Kyoto Protocol*		*FM and elected Article 3.4 activities of the Kyoto Protocol*				
	Land-use change	*AR*	*Deforestation*	*FM*	*CM*	*GM*	*RV*	*WDR*
FMRL				–1 425.00				
Technical correction				NE				
Base year	752.27				NA	NA	NA	NA
2013		–747.53	1 510.89	–1 425.15	NA	NA	NA	NA
2014		–802.87	1 543.71	–1 415.31	NA	NA	NA	NA
2015		–859.34	1 576.79	–1 390.78	NA	NA	NA	NA
Per cent change Base year–2015					**NA**	**NA**	**NA**	**NA**

Note: Values in this table include emissions on lands subject to natural disturbances, if applicable.

[a] The Netherlands has not elected any activities under Article 3, paragraph 4, of the Kyoto Protocol. For activities under Article 3, paragraph 3, of the Kyoto Protocol, and FM under Article 3, paragraph 4, only the inventory years of the commitment period must be reported.

[b] The value reported in this column refers to 1990.

2. Table 10 provides an overview of relevant key data for the Netherlands's reporting under Article 3, paragraphs 3 and 4, of the Kyoto Protocol.

Table 10

Key relevant data for the Netherlands under Article 3, paragraphs 3 and 4, of the Kyoto Protocol

Key parameters	*Values*
Periodicity of accounting	(a) AR: commitment period accounting
	(b) Deforestation: commitment period accounting
	(c) FM: commitment period accounting
	(d) CM: not elected
	(e) GM: not elected
	(f) RV: not elected
	(g) WDR: not elected
Election of activities under Article 3, paragraph 4	None
Election of application of provisions for natural disturbances	Yes, for AR and FM
3.5% of total base-year GHG emissions, excluding LULUCF and including indirect CO_2 emissions	7 776.39 kt CO_2 eq (62 495.551 kt CO_2 eq for the duration of the commitment period)
Cancellation of AAUs, ERUs, CERs and/or issuance of RMUs in the national registry for:	
1. AR in 2015	NA
2. Deforestation in 2015	NA
3. FM in 2015	NA
4. CM in 2015	NA
5. GM in 2015	NA
6. RV in 2015	NA
7. WDR in 2015	NA

Annex II

Information to be included in the compilation and accounting database

Tables 11–13 include the information to be included in the compilation and accounting database for the Netherlands. Data shown are from the original annual submission of the Party, including the latest revised estimates submitted, adjustments (if applicable) as well as the final data to be included in the compilation and accounting database.

Table 11
Information to be included in the compilation and accounting database for 2015, including on the commitment period reserve, for the Netherlands
(t CO_2 eq)

	Original submission	*Revised estimates*	*Adjustment*	*Final*
CPR	832 300 112			832 300 112
Annex A emissions for 2015				
CO_2[a]	165 334 277			165 334 277
CH_4	19 000 753			19 000 753
N_2O	8 331 869			8 331 869
HFCs	2 335 725			2 335 725
PFCs	104 220			104 220
Unspecified mix of HFCs and PFCs	NO			NO
SF_6	138 829			138 829
NF_3	NO, IE			NO, IE
Total Annex A sources	**195 245 673**			**195 245 673**
Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2015				
3.3 AR	−859 336			−859 336
3.3 Deforestation	1 576 792			1 576 792
FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2015				
3.4 FM	−1 390 785			−1 390 785

[a] CO_2 emissions include indirect CO_2 emissions reported in CRF table 6.

Table 12
Information to be included in the compilation and accounting database for 2014, for the Netherlands
(t CO_2 eq)

	Original submission	*Revised estimates*	*Adjustment*	*Final*
Annex A emissions for 2014				
CO_2[a]	158 252 634			158 252 634
CH_4	18 784 432			18 784 432
N_2O	8 065 331			8 065 331
HFCs	2 252 211			2 252 211
PFCs	93 210			93 210
Unspecified mix of HFCs and PFCs	NO			NO
SF_6	134 588			134 588
NF_3	NO, IE			NO, IE
Total Annex A sources	**187 582 406**			**187 582 406**
Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2014				
3.3 AR	–802 873			–802 873
3.3 Deforestation	1 543 712			1 543 712
FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2014				
3.4 FM	–1 415 306			–1 415 306

[a] CO_2 emissions include indirect CO_2 emissions reported in CRF table 6.

Table 13
Information to be included in the compilation and accounting database for 2013, for the Netherlands
(t CO_2 eq)

	Original submission	*Revised estimates*	*Adjustment*	*Final*
Annex A emissions for 2013				
CO_2[a]	165 788 584			165 788 584
CH_4	19 161 788			19 161 788
N_2O	7 960 142			7 960 142
HFCs	2 446 494			2 446 494
PFCs	143 757			143 757
Unspecified mix of HFCs and PFCs	NO			NO
SF_6	119 860			119 860
NF_3	NO, IE			NO, IE
Total Annex A sources	**195 620 624**			**195 620 624**
Activities under Article 3, paragraph 3, of the Kyoto Protocol for 2013				
3.3 AR	–747 534			–747 534
3.3 Deforestation	1 510 893			1 510 893
FM and elected activities under Article 3, paragraph 4, of the Kyoto Protocol for 2013				
3.4 FM	–1 425 150			–1 425 150

[a] CO_2 emissions include indirect CO_2 emissions reported in CRF table 6.

Annex III

Additional information to support findings in table 2

Missing categories that may affect completeness

The categories for which methods are included in the 2006 IPCC Guidelines that were reported as "NE" or for which the ERT otherwise determined that there may be an issue with the completeness of the reporting in the Party's inventory are the following:

(a) CO_2, CH_4 and N_2O emissions from liquid fuels, gaseous fuels, other fossil fuels and biomass for manufacture of solid fuels and other energy industries (see ID #E.17 in table 5);

(b) CO_2 emissions from lime production (see ID# I.3 in table 3);

(c) CH_4 and N_2O emissions from mules and asses (1990–2009) (see ID#A.8 in table 5);

(d) CSC in living biomass (gains and losses) under cropland remaining cropland (see ID#s L.1(a) in table 3 and L.12 in table 5);

(e) CSC in DOM under land converted to cropland, except for forest land converted to cropland (see ID#s L.1(b) in table 3 and L.12 in table 5);

(f) CSC in living biomass (losses) under wetlands, settlements and other land converted to cropland (see ID#s L.1(c) in table 3 and L.12 in table 5);

(g) CSC in DOM under cropland, wetlands, settlements and other land converted to grassland (see ID#s L.1(d) in table 3 and L.12 in table 5);

(h) CSC in living biomass (losses) under wetlands, settlements and other land converted to grassland (see ID#s L.1(e) in table 3 and L.12 in table 5);

(i) CSC in living biomass (gains) under land converted to wetlands (see ID#s L.1(f) in table 3 and L.12 in table 5);

(j) CSC in living biomass (gains) under land converted to settlements (see ID#s L.1(g) in table 3 and L.12 in table 5);

(k) CSC in living biomass (losses) under wetlands and other land converted to settlements (see ID#s L.1(h) in table 3 and L.12 in table 5);

(l) CSC in living biomass (gains) under land converted to other land (see ID#s L.1(i) in table 3 and L.12 in table 5);

(m) CSC in DOM under land converted to settlements, except for forest land converted to settlements (see ID#s L.1(j) in table 3 and L.12 in table 5);

(n) CSC in DOM under cropland, grassland, wetlands and settlements converted to other land (see ID#s L.1(k) in table 3 and L.12 in table 5);

(o) CO_2 and N_2O emissions and removals from drainage and rewetting and other management of organic/mineral soils (see ID# L.18 in table 5);

(p) CO_2 and N_2O emissions from drained and rewetted organic soils on areas of afforestation and FM (see ID# KL.14 in table 5).

Annex IV

Documents and information used during the review

A. Reference documents

Reports of the Intergovernmental Panel on Climate Change

IPCC. 2006. *2006 IPCC Guidelines for National Greenhouse Gas Inventories*. S Eggleston, L Buendia, K Miwa, et al. (eds.). Available at http://www.ipcc-nggip.iges.or.jp/public/2006gl/.

IPCC. 2014. *2013 Revised Supplementary Methods and Good Practice Guidance Arising from the Kyoto Protocol*. T Hiraishi, T Krug, K Tanabe, et al. (eds.). Available at http://www.ipcc-nggip.iges.or.jp/public/kpsg/.

IPCC. 2014. *2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands*. T Hiraishi, T Krug, K Tanabe, et al. (eds.). Available at http://www.ipcc-nggip.iges.or.jp/public/wetlands/.

Annual review reports

Reports on the individual reviews of the 2013, 2014, 2015 and 2016 annual submissions of the Netherlands, contained in documents FCCC/ARR/2013/NLD, FCCC/ARR/2014/NLD, FCCC/ARR/2015/NLD and FCCC/ARR/2016/NLD, respectively.

Other

Aggregate information on greenhouse gas emissions by sources and removals by sinks for Parties included in Annex I to the Convention. Note by the secretariat. Available at http://unfccc.int/resource/webdocs/agi/2017.pdf.

Annual status report for the Netherlands for 2017. Available at http://unfccc.int/resource/docs/2017/asr/NLD.pdf.

Arets EJMM, van der Kolk JWH, Hengeveld GM, et al. 2017. *Greenhouse Gas Reporting for the LULUCF sector in the Netherlands. Methodological background, update 2017*. Wot-technical report 95. Wageningen, the Netherlands: Statutory Research Tasks Unit for Nature & the Environment. Available at https://www.wur.nl/upload_mm/3/b/9/896a9f57-3daf-4c0c-b64e-81142f0f90e3_WOt-technical%20report%2095%20webversie.pdf.

De Waal et al. 2012. *Soil Carbon Dynamics and Variability at the Landscape Scale: its relation to aspects of spatial distribution in national emission databases*. Alterra: KvR 056/12. Wageningen, the Netherlands: Alterra. Available at: http://edepot.wur.nl/289947.

ENINA. 2017. *Methodology Report on the Calculation of Emissions to Air from the sectors Energy, Industry and Waste (Update 2016)*. Available at https://english.rvo.nl/sites/default/files/2017/04/ENINA_2016.pdf.

Kuikman PJ. 2017. *Peer Review Dutch draft NIR 2017 on N_2O and CO_2 emissions from the sector agriculture*. Wageningen, the Netherlands: Wageningen Environmental Research (Alterra).

Liski J et al. 2002. Increasing carbon stocks in the forest soils of western Europe. *Forest Ecology and Management*. 169(1–2): pp.159–175.

Mol et al. 2011. *Scientific Arguments for Net Carbon Increase in Soil Organic Matter in Dutch Forests*. Alterra report 2324. Wageningen, the Netherlands: Alterra. Available at: https://www.wur.nl/en/project/Sequestration-Dutch-forests.htm.

Tauw. 2011. *Validatie van het nationale stortgas emissiemodel*. Deventer, the Netherlands.

Vonk J, Bannink A, van Bruggen C, et al. 2016. *Methodology for Estimating Emissions from Agriculture in the Netherlands. Calculations of CH_4, NH_3, N_2O, NOx, PM10, PM2.5 and CO_2 with the National Emission Model for Agriculture (NEMA)*. WOt-report 2016.53. Wageningen, the Netherlands: WOT Nature and Environment.

B. Additional information provided by the Party

Responses to questions during the review were received from Mr. Peter Zijlema (Netherlands Enterprise Agency (RVO.nl)), including additional material on the methodologies and assumptions used. The following documents[1] were also provided by the Netherlands:

DHV, 2010: *Update of emission factors for N_2O and CH_4 for composting, anaerobic digestion and waste incineration.* Report MD-AF20100263/mk, July. DHV, Amersfoort.

Jansen B.I, Nijkamp M.M, et al. 2017 *Methods used for the Dutch Emission Inventory, Product usave by consumers, constction and services.* Emissions calculated by the task force WESP Working group for emissions from services and product use Netherlands' Pollutant Release and Tranfer Register.

Klein J., G. Geilenkirchen, J. Hulskotte, A. Hensema, P. Fortuin & H. Molnár-in 't Veld, 2017: *Methods for calculating the emissions of transport in the Netherlands.* Statistics Netherlands, PBL Netherlands Enviromental Assessement Agency, TNO, RWS Center for Transport and Navigation (WVL).

[1] Reproduced as received from the Party.